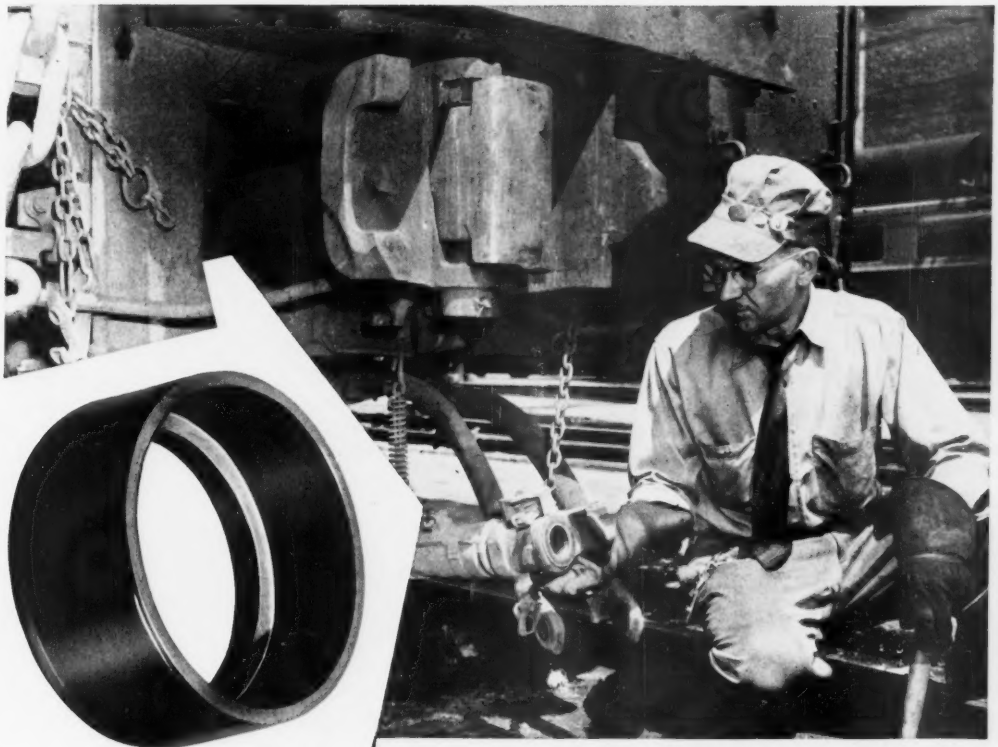
Another new development using

B. F. Goodrich Chemical *raw materials*



Seal made by Roth Rubber Co., Chicago, for Vapor Heating Corp., Chicago. B. F. Goodrich Chemical Co. supplies the Hycar rubber only.

Hot steam handled from coach to coach

—WITH HYCAR'S HELP!

THAT flexible, metallic conduit pictured has a rough, tough job—carrying steam heated to 400°F., under 250 pounds pressure, for heating railroad coaches.

Connected between cars, it has eight swivel joints to absorb jolts when the train rolls along. A seal at each joint must withstand the hot steam and vibration. And the seal manufacturer found that one made of Hycar, faced with asbestos, met all the severe requirements.

A natural choice, too, for Hycar has advantages that make it ideal for rugged service like this. Hycar rubber compounds can be made resistant to heat and cold, yet remain flexible and resilient under extreme temperatures. Hycar also resists water, weather, abrasion . . . gas, oil, many chemicals and more damaging factors.

Hycar may be the answer to your product development or improvement problems—the way to better, more saleable products. For helpful technical information on Hycar rubber compounds, please write Dept. HA-5, B. F. Goodrich Chemical Co., Rose Building, Cleveland 15, Ohio. In Canada: Kitchener, Ont. Cable address: Goodchemco.

B. F. Goodrich Chemical Company
A Division of The B. F. Goodrich Company

Hycar
American Rubber

GEON polyvinyl materials • HYCAR American rubber • GOOD-RITE chemicals and plasticizers • HARMON organic colors

Makers of tires are most emphatic

Philblack* O *reduces static!*

● Increasing numbers of tire manufacturers . . . and makers of conveyor belts and industrial hose, too . . . use Philblack O to reduce dangerous buildup of electricity. They choose Philblack O in place of other conductive blacks because this superior HAF black gives them more for their money . . . remarkable abrasion resistance, exceptional flex life, fine aging qualities . . . all these extra advantages *at reasonable cost!*

For complete data on the performance of Philblack O compared with other blacks, consult the Philblack technical sales representative who calls on you. Practical, expert advice on compounding problems is available, without obligation, at the Philblack Sales Service Laboratory in downtown Akron. Dense, firm Philblack O pellets handle efficiently in hopper cars and most bulk conveyor systems. Also available in bags.

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PHILBLACK SALES DIVISION

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* A Trademark

Philblack A and Philblack O are manufactured at Borger, Texas. Warehouses in Akron, Boston, Chicago and Trenton.
West Coast agent: Harwick Standard Chemical Company, Los Angeles. Canadian agent: H. L. Blachford, Ltd., Montreal and Toronto.

You get rubber flooring
that's 8 ways better
with PLIOLITE S-6B

PLIOLITE S-6B

From processing to end product—rubber flooring in either sheet or tile form can be improved 8 ways when you use PLIOLITE S-6B as reinforcing agent:

1 – Easier processability
2 – Fewer rejects due to blisters and uneven flow
3 – Increased hot tear strength, still further reducing rejects
4 – Reduced cure time
5 – Increased hardness
6 – Improved flexibility
7 – Added abrasion resistance
8 – Smoother, glossier surface

Whether you use neoprene, natural rubber, CHEMIGUM, cold rubber or conventional GRS, you'll get these product improvements, too. And PLIOLITE S-6B does not limit color possibilities—even improves aging and color retention in light stocks when used in conjunction with WING-STAY S, Goodyear's use-proved antioxidant.

Try PLIOLITE S-6B—"The Best Known—Known as the Best" rubber reinforcing resin. For details write:

Goodyear, Chemical Division,
Akron 16, Ohio

CHEMICAL GOODYEAR DIVISION

Chemigum, Pliobond, Pliolite, Pliovic, Wing-Stay—T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

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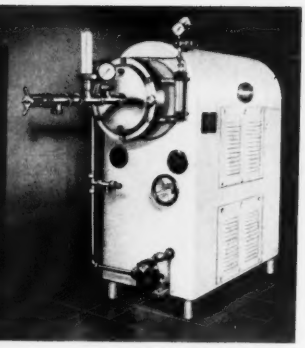
OAKES

CONTINUOUS, AUTOMATIC

FROTHING MACHINE



Partial List of Users

American Foam Rubber Corporation
Burlington, New Jersey

American Latex Products Corporation
Hawthorne, California

Amertex Manufacturing Corporation
Portsmouth, Virginia

Armour & Company, Chicago, Illinois

Armstrong Rubber Company
West Haven, Connecticut

Automotive Rubber & Carpet Industries, Inc.
Yonkers, New York

Crown Rubber Company, Fremont, Ohio

Dunlop Tire & Rubber Corporation
Buffalo, New York

Faultless Rubber Company, Ashland, Ohio

Firestone Rubber & Latex Products Company
Fall River, Massachusetts

Fremont Rubber Company, Fremont, Ohio

Globe Manufacturing Company
Fall River, Massachusetts

Goodyear Tire & Rubber Company, Akron, Ohio

Hewitt-Robins, Incorporated, Buffalo, New York

International Latex Corporation
Dover, Delaware

James Lees & Sons Company
Bridgeport, Pennsylvania

Toyad Corporation, Latrobe, Pennsylvania

United States Rubber Company
New York, New York

Most installations use more than one unit.

If you are considering foam latex—natural or synthetic

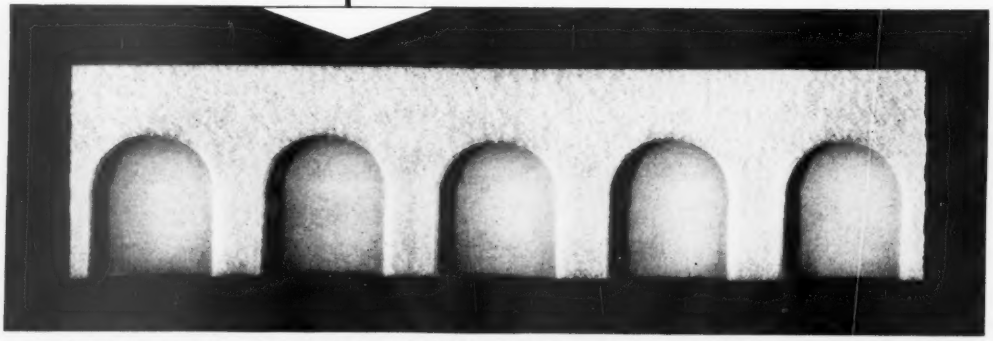
THE CONTINUOUS WAY IS THE PROFITABLE WAY!

Here is what the AMF-Oakes Continuous, Automatic Frothing Machine can do for you:

- Froth 200 to 2,000 pounds of foam latex per hour.
- Produce latex blow-ups of 6 to 18.
- Suitable for slabs, molds, rug backings, pillows, mattresses, furniture and automobile upholstery.
- Ideal for INJECTION MOLDING.

For Complete Information...

Write to Mr. T. R. Stevens,
Continuous Mixing Division
AMERICAN MACHINE & FOUNDRY COMPANY
511 Fifth Avenue, New York 17, N. Y.



Unretouched photograph of foam rubber frothed on the AMF-OAKES Continuous, Automatic Frothing Machine. (Latex blow-up of 14)

—and it keeps its color brighter, longer with WING-STAY S

Wing-Stay S

Despite aging and wear, light-colored rubber flooring will remain bright and attractive for longer periods – if the stock used in making sheet or tile is protected with WING-STAY S. Of all available antioxidants, Goodyear's use-proved WING-STAY S gives the best balance of protection and low cost, together with a minimum of staining, discoloration, odor, migration, exudation.

Already incorporated in GRS-1006, GRS-1502 and GRS-X693 before purchase, WING-STAY S can be easily added to other rubbers in compounding. It has been proved by use in such diverse applications as white sidewall tires, foamed rubber stocks, wringer rolls, gaskets, light-colored shoe soles, refrigerator gaskets, gloves and various mechanical rubber products.

Investigate WING-STAY S today – by calling or writing:

Goodyear, Chemical Division,
Akron 16, Ohio

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Chemigum, Pliobond, Pliolite, Pliovic, Wing-Stay–
T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

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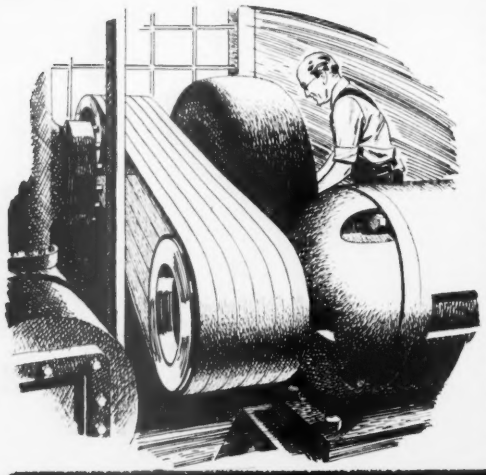
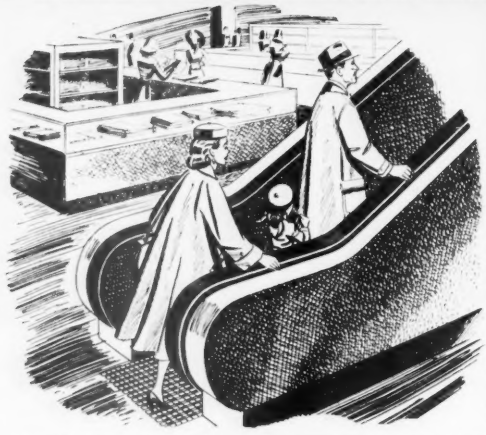


If it's got to be a real ALL-AROUND PERFORMER..



make it "SHAWMUT BELTING DUCK"

another Wellington Sears fabric for the rubber industry

Year after year Shawmut Belting Duck continues to supply the answer to a variety of rubber-and-fabric problems. It's specified wherever great longitudinal strength, good adhesion and bulking properties and economical cost are needed.

This sturdy, pliable belting owes its strength to the precisely controlled construction and twist of the rugged plied yarns in the warp and filling. It's produced by a mill that has specialized in heavy-duty fabrics for more than 100 years.

Shawmut Belting Duck is just one of many famous Wellington Sears cotton ducks for belting and other mechanical rubber products. The use of Superior Army Duck as a cover fabric for V-belts is another example.

Wellington Sears has the answer, too, for special problems, such as the need for exceptional troughing qualities in conveyor belts, or power transmission belts combining unusual strength with minimum weight and bulk. We have developed fabrics to utilize the unique properties of nylon, high-tenacity rayon and other fibers.

Typical fabrics for the rubber industry are at the right. A call or letter to your nearest Wellington Sears office will place full information at your disposal. Let's talk it over.

Superior Fabrics for the Rubber Industry

- Belting duck
- Hose duck
- Enameling duck
- Army duck
- Single and two-ply chafers
- Sheeting
- Airplane cloth
- Balloon cloth
- Nylon, high-tenacity rayon, other synthetics and blends.

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"Smoother, more even extrusions"
"Best clarity ever obtained"
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In Calendered Goods

"Increased calender speed"
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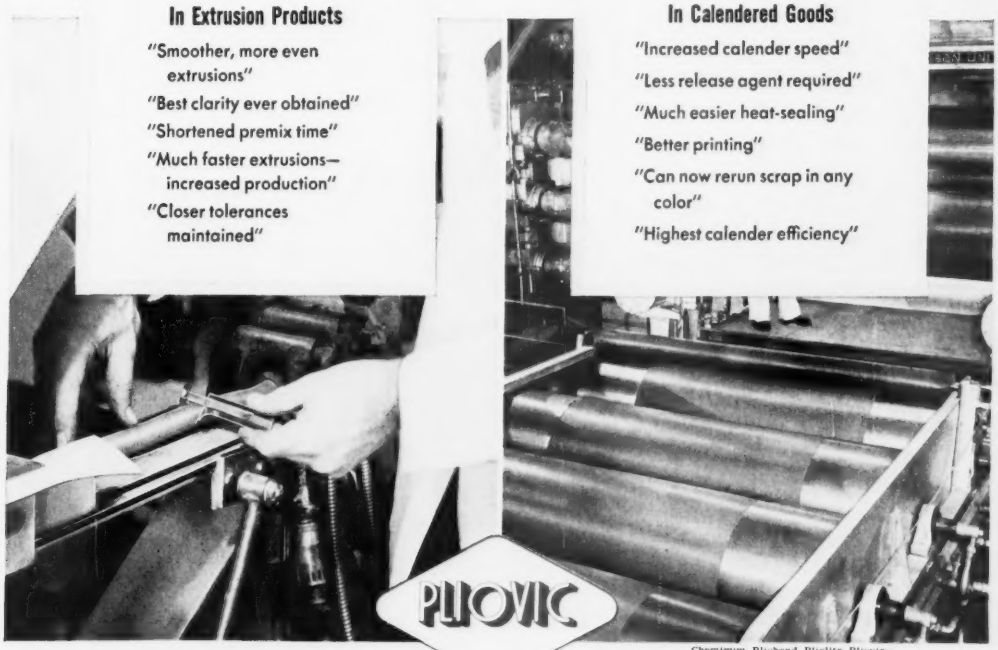
"Much easier heat-sealing"
"Better printing"
"Can now rerun scrap in any color"
"Highest calender efficiency"



Chemigum, Pliobond, Pliolite, Pliovic—
T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

Comments like these from vinyl users have greeted the introduction of the *new* PLIOVIC G90V–first in a series of new polyvinyl chloride resins to be introduced by Goodyear. And they agree that the high uniform bulk density of this new PLIOVIC makes it tops in easy handling, with its excellent thermal stability contributing to higher production speeds and reduction of waste. Thorough evaluation has shown the new PLIOVIC has other advantages as well, such as low water absorption, excellent cold temperature properties, and easy interchangeability with other resins.

PLIOVIC G90V – the *new* polyvinyl chloride resin by Goodyear–can give you these advantages in your plant. It will pay you to write for details to Goodyear – the source of major advances in vinyls. Address:

Goodyear, Chemical Division, Dept. R, Akron 16, Ohio

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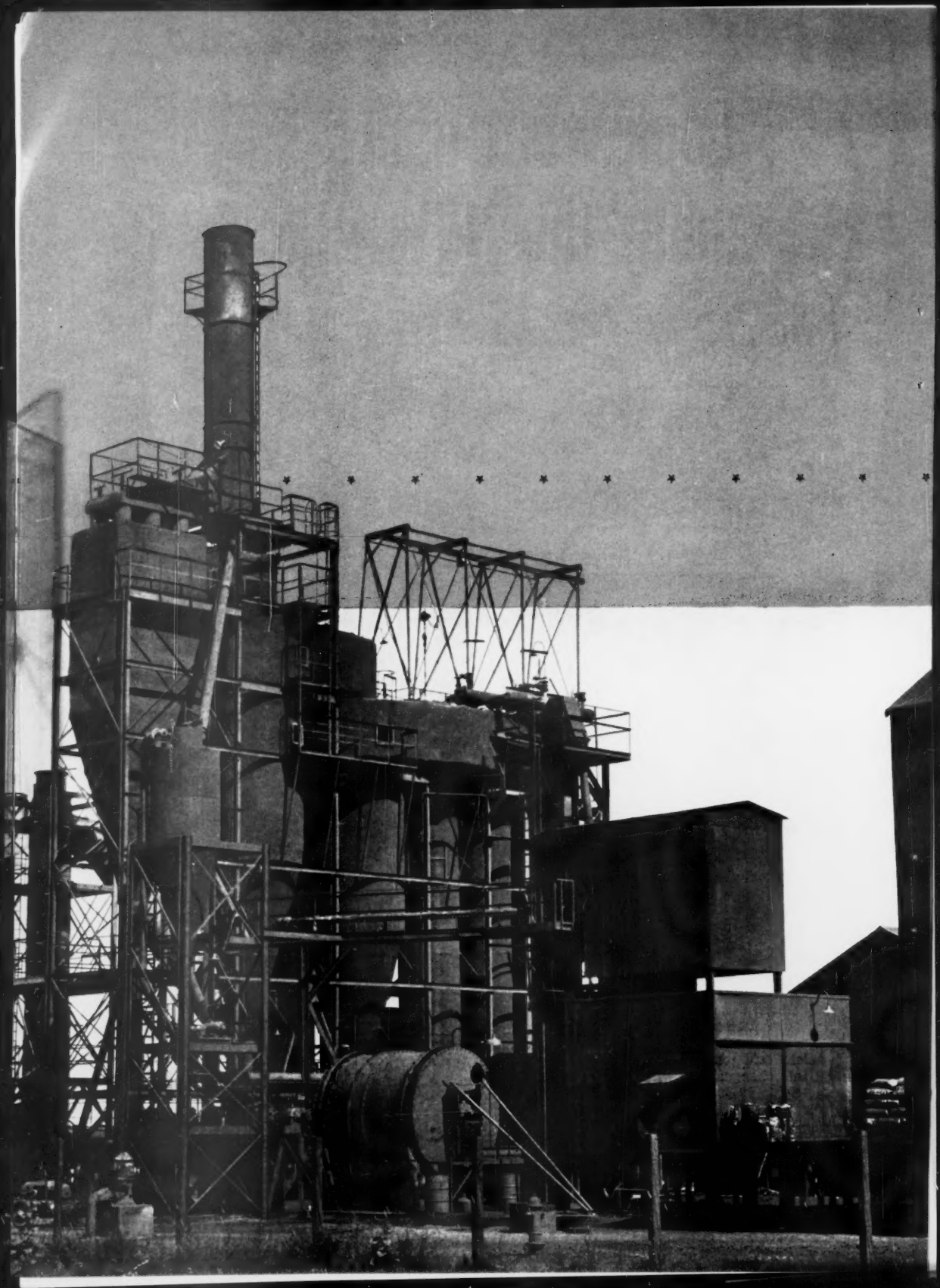

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3. ☐ Tear resistance
4. ☐ Crack growth resistance
5. ☐ .....
   (What's your problem?)

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Many costly production problems can readily be solved through the use of Barrett's rubber compounding materials. We invite your use of Barrett's new Applications Research Laboratory, Edgewater, New Jersey, in solving your particular problem. May we send you our booklet describing the complete equipment and services of the laboratory?

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BRV Rubber Softener*
*BRT*3 Rubber Reclaiming Tar*
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CALCO CHEMICAL DIVISION
INTERMEDIATE & RUBBER CHEMICALS DEPARTMENT
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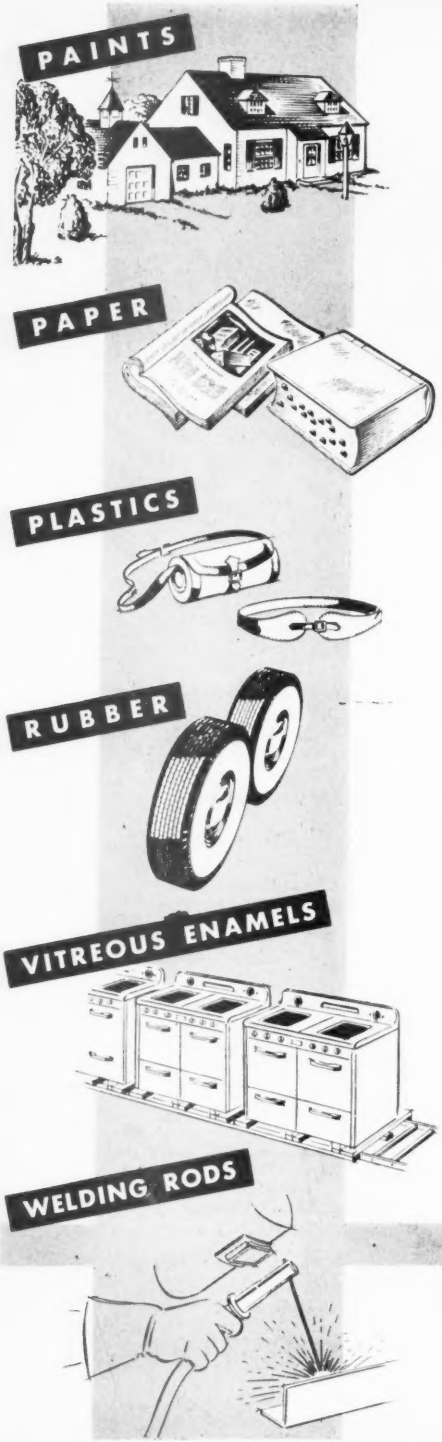

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For a new high peak in production, achieved in less time and at lowest cost, you can depend on these rugged work horses of the rubber industry.

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We are proud to announce the opening of our Ivanhoe furnace black plant near Franklin, Louisiana.

This plant combines the newest engineering designs and advanced research developments for the manufacture of leading quality oil base carbon black of the HAF type and has a capacity of more than thirty million pounds per year.

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THERE'S only one *right* way to produce plasticizers with the uniform high quality demanded in your plastics production today: control *every* phase of production, from coal to finished plasticizer. And that's exactly what we do in the manufacture of Pittsburgh PX Plasticizers.

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PX-108	DiIsoOctyl Phthalate
PX-109	DiNonyl Phthalate
PX-138	DiOctyl Phthalate
PX-208	DiIsoOctyl Adipate
PX-209	DiNonyl Adipate
PX-938	DiOctyl Adipate
PX-404	DiButyl Sebacate
PX-408	DiIsoOctyl Sebacate
PX-438	DiOctyl Sebacate
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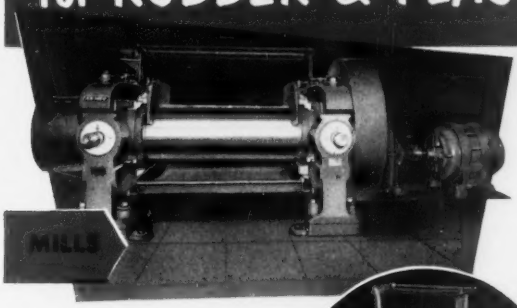
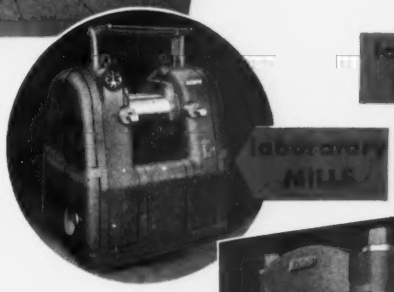


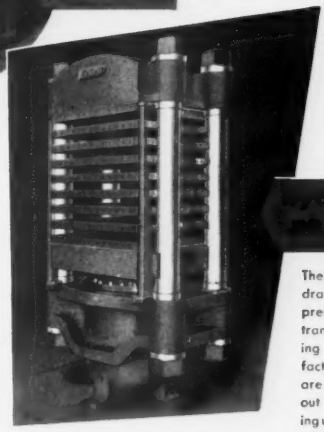
Installations throughout the world attest to the usefulness and productivity of EEMCO Rubber & Plastics Processing Machines. Learn about the speedier production and low upkeep EEMCO offers before you buy. Write for quotations and delivery dates.

Correct design and sturdy dependability are featured in EEMCO Mills. For mixing and compounding all kinds of rubber or plastics, they're furnished in sizes up to 84 inches, in single units or two or more "in line."



The 42 ton laboratory press is entirely self-contained, equipped with 12" x 12" platens. Occupies only 14" x 26" floor space. Adjustable openings. Ideal for laboratory use and small production.

The laboratory mill is self-contained—easy to clean. Rolls which are 6" x 12" are individually cooled or heated. Mills are furnished with constant speed or variable speed drives. For laboratory or small production.



The EEMCO line of hydraulic presses includes presses for compression or transfer molding, laminating and polishing. Manufactured in all sizes they are furnished with or without self-contained pumping units or special features. Consult with EEMCO on all of your rubber and plastics processing machinery needs.

A medium priced line of presses especially designed for reinforced plastics molding is offered in the following standard sizes with a working area of 37" x 55", 47" x 41", 26" x 42", 32" x 36", and 44" x 76". Other sizes made to suit your requirements. With or without pumps and controls this line also offers the molder a complete advisory service in the production of reinforced plastics molded parts or finished products.

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HYDRAULIC PRESSES
compression • transfer
reinforced plastics
• • •
Laboratory MILLS & PRESSES

Easy release and clean molds with DOW CORNING Mold Lubricants

Production has gone sky-high since the company switched to Dow Corning Silicone release agents, and Moe Muscles never had it so good. Inspector Mike can't quibble, either. Molded parts are cleaner than ever before. Sharp, uniform detail, closer tolerances and high surface finish have become commonplace. Scrap has dwindled away to the vanishing point.

Mike knows that other production costs have dropped off, too. Molds stay clean from 5 to 20 times longer than when lubricated with ordinary release agents because Dow Corning silicones can't break down to form a carbonaceous build-up on mold surfaces. Cleaning schedules are reduced, service life is lengthened and maintenance costs are cut by as much as 80%.

For easier release and lower costs, specify Dow Corning silicone mold release agents: emulsions for molds and curing bags; fluid for green carcass, bead and parting line release.

Deep Cavity Molds

Curing Bags

Heavily Loaded Stocks

DOW CORNING SILICONES MEAN BUSINESS!

For more information call our nearest branch office or write direct for Data Sheet CM-21.

DOW CORNING CORPORATION

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DOW CORNING SILICONES

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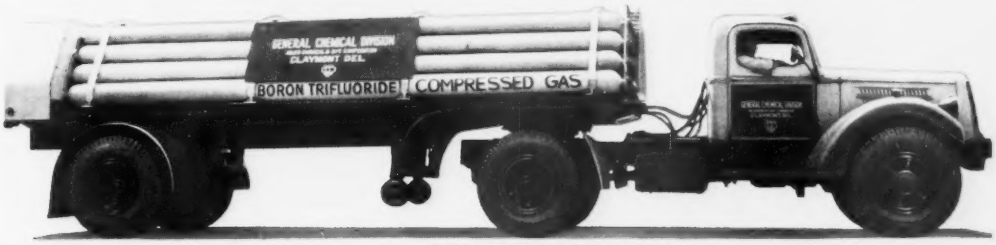
NOW, GENERAL CHEMICAL BRINGS INDUSTRY THIS

Versatile Catalyst

BORON TRIFLUORIDE

in Many Forms...in Tonnage Quantities*



A LABORATORY CURIOSITY less than a decade ago, now an industrial chemical of tremendous significance as a catalyst—that is the story of Boron Trifluoride as developed by General Chemical's fluorine research program.

Today, the catalytic properties of Boron Trifluoride . . . both as a compressed gas and in its various complexes . . . are being utilized in many major industrial fields. These include petroleum, synthetic rubber, resins, solvents, plastics, dyestuffs, metallurgy, etc. With it, many hitherto impossible operating problems involving organic reactions are being solved.

To meet every processing need, General Chemical produces Boron Trifluoride both as a gas and in a wide range of complexes. Recently, General began regularly-scheduled tonnage shipments of the compressed gas by tank truck, marking another milestone in the expanding use of this new industrial chemical.

Listed at the right are many of the reactions in which General's BF_3 is now being utilized. If your operations involve these or similar techniques, you may find it advantageous to investigate Boron Trifluoride and its complexes.

For further information, for experimental samples of any of the products listed, or for confidential discussion of your particular needs, consult the nearest General Chemical office serving you.

Present or Potential Uses of BF_3 as a Catalyst

POLYMERIZATION

ALKYLATION

ESTERIFICATION

ISOMERIZATION

CYCLIZATION

ACYLATION

BASIC CHEMICALS

FOR AMERICAN INDUSTRY

*** GENERAL CHEMICAL'S BF_3 PRODUCTS**

Commercially Available in Tonnage Quantities

Compressed Gas	
Phenol Complex	**(Liquid)**
Etherate Complex	**(Liquid)**

Available in Limited Commercial Quantities

Ammonia Complex	**(Solid)**
Diacetic Acid Complex	**(Liquid)**
Di-normal Butyl Ether Complex	**(Liquid)**
Dihydrate	**(Liquid)**
Piperidine Complex	**(Solid)**

Other Complexes

In addition, extensive research and production facilities place General Chemical in a preferred position to work with you in development of other BF_3 complexes to meet individual specifications.

GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION

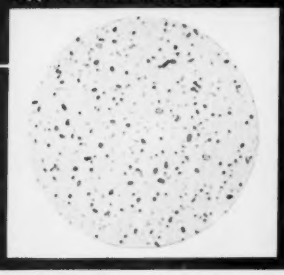
40 Rector Street, New York 6, N. Y.

Offices in Principal Cities from Coast to Coast

NOW AVAILABLE

A fast-curing, fine particle size zinc oxide specially surface treated to insure rapid and complete dispersion in rubber.

Magnification 1500X
Approx. Scale: 1 Micron = 1/16 in.



ST. JOE BLACK LABEL #20-21

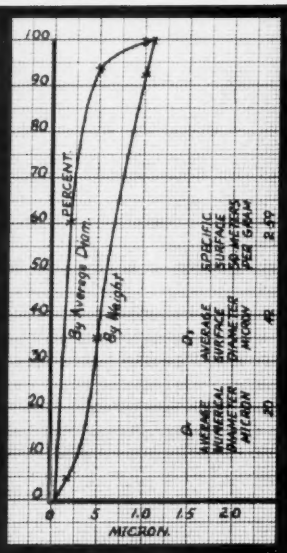
Representative Chemical Tests

ZnO	99.00%
Pb	.03
Cd	.01
Mn	.003
Cu	.002
Acidity as SO_3	—*
Total S as SO_3	.05
H_2O soluble salts	—*
Insoluble in HCl	.15
Loss at 110° C.	.30
Organic Material	.25

*Hydrophobic: Cannot be determined by normal methods.

Representative Physical Tests

Particle size	
Average numerical diameter D_1 — microns	.20
Average surface diameter D_3—microns	.42
Specific surface—Sq.M./gram	2.59
Percent fines under .50 micron	35.0
Specific gravity	5.65
Apparent density—lb./cu. ft.	30.
Cleanliness	
Percent thru 325 mesh screen	99.97



Particle Size Distribution

ST. JOSEPH LEAD COMPANY

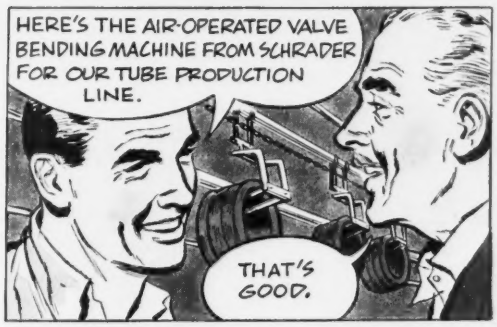
250 PARK AVE.
NEW YORK CITY 17

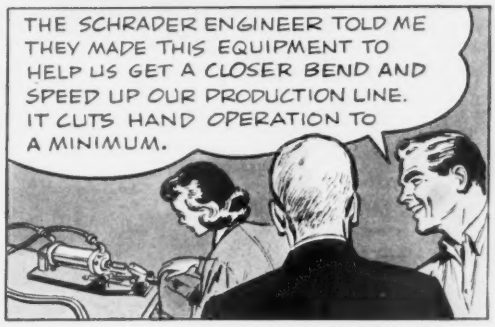
Plant & Laboratory: Monaca (Josephtown) Pa.

For improved dispersion and rapid incorporation in rubber compounds we recommend **Black Label #20-21.** Made by surface treating Black Label #20 with a hydrophobic, high molecular weight organic ester, this high quality St. Joe Zinc Oxide combines the excellent reinforcing and activating properties of a fine particle size pigment with the rapid dispersion characteristics usually associated with the larger particle size types.

Complete physical and chemical properties of St. Joe rubber grade zinc oxides are described in our new technical manual, ST. JOE ZINC OXIDES. Write for your free copy—on your company letterhead please.

Schrader Contributions to the Tire Industry




THE SCHRADER ENGINEER TOLD ME THEY MADE THIS EQUIPMENT TO HELP US GET A CLOSER BEND AND SPEED UP OUR PRODUCTION LINE. IT CUTS HAND OPERATION TO A MINIMUM.

IT SURE PAYS TO DO BUSINESS WITH SCHRADER!
I GUESS IT'S HARD TO BEAT SCHRADER SERVICE, AND ANOTHER THING: THIS EQUIPMENT IS DEVELOPED AT SCHRADER'S EXPENSE FOR OUR USE!

NOTE TO THE TIRE INDUSTRY:

Schrader service extends right to the tube production line. We make available special equipment to help you speed production of pneumatic tubes. Are you taking full advantage of this phase of Schrader service?

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Division of Scovill Manufacturing Company, Incorporated

Schrader
REG. U. S. PAT. OFF.

FIRST NAME IN TIRE VALVES
FOR ORIGINAL EQUIPMENT AND REPLACEMENT

SEE WHAT IS AVAILABLE AT

Farrel-Birmingham has earned the right to the title of "Calender Headquarters" because it has--

BUILT MORE CALENDERS for processing rubber, plastics, linoleum, asphalt tile and other materials than all other manufacturers combined. In the last few years, the company has made over 100 plastics calenders alone.

BUILT MORE DIFFERENT TYPES OF CALENDERS, including every one represented by the thirty-four diagrams shown on the opposite page.

PIONEERED MORE IMPROVEMENTS IN DESIGN. For example, the Z-type calender which has been specially developed for high-speed production of plastic film and fabric coating. One manufacturer, using a Z-type calender, is able to produce, for the first time on a commercial scale, 1.7 gauge, calendered, unsupported vinyl film. The variation in accuracy of gauge of the final product is less than plus or minus .0001 inch. Other records, equally impressive, have been established by Farrel-Birmingham calenders in other fields.

BEFORE YOU DECIDE ON A CALENDER, call in a Farrel-Birmingham engineer. With the experience of "Calender Headquarters" behind him, he will be able to help you find a solution to your calendering problems. In the meantime, send for a copy of Bulletin No. 174 which describes these calenders in detail.

FARREL-BIRMINGHAM COMPANY, INC.

ANSONIA, CONNECTICUT

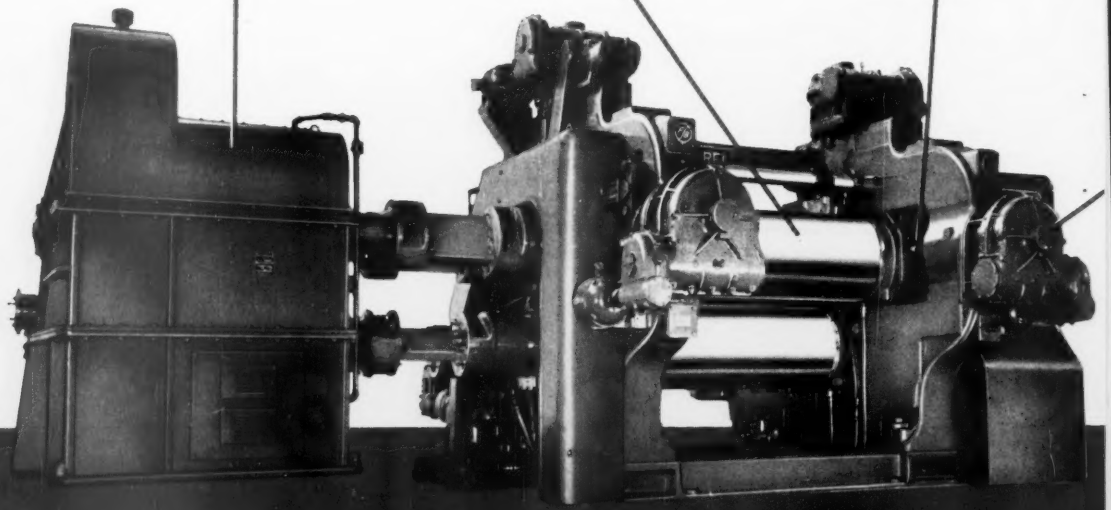
Plants: Ansonia and Derby, Conn., Buffalo, N. Y.

Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Los Angeles, Houston

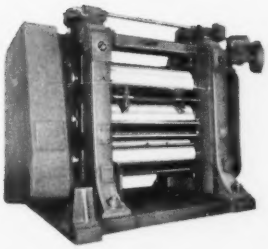
GEARING enclosed in **separate** uni-drive and connected to the rolls by universal spindles. Assures smooth and efficient transmission of power at high speeds and under heavy torque loads.

Z-TYPE FORMATION OF ROLLS eliminates the effect on roll settings of pressure from a third roll. A built-in device provides means for crossing the roll axes to compensate for deflection.

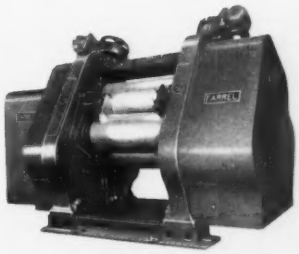
PRECISION BEARINGS with hydraulic pullbacks for holding rolls in positive operating position. Labyrinth oil seals positively retain oil in boxes and prevent contamination of stock.



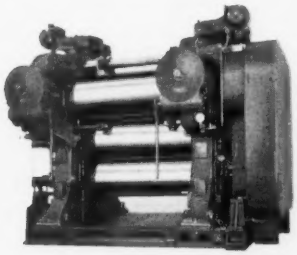
"CALENDER HEADQUARTERS"



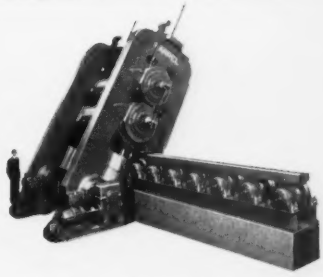
24"x68" three-roll rubber calender equipped with spreader roll, tension roll, knife bar, weighted pressure roll and guides. Windup and letoff are on the other side.



24"x56" special, three-roll, triangular calender for sheeting and coating. Arrangement of rolls facilitates feeding and provides closer control of gauge.



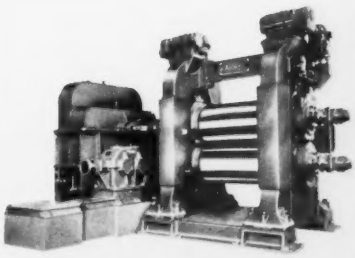
24"x66" four-roll inverted L-type plastics calender with individual motor adjustment on each screw of top and bottom rolls and hand ratchet adjustment for the side roll.



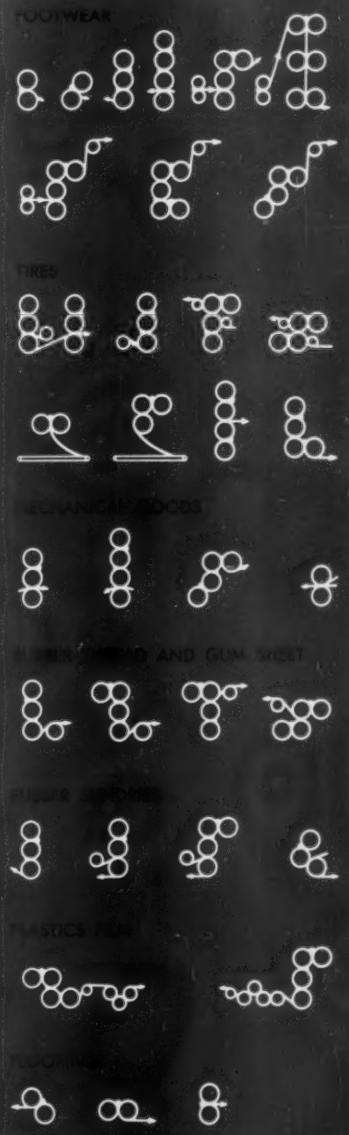
This giant 48"x84" two-roll inclined linoleum calender is the largest in the industry. Because of the great weight of the rolls, a roller table mounted on antifriction bearings is provided for roll removal.

ROLL ADJUSTMENT by individual motor for each screw permits extremely fine adjustment. Pushbutton control provides for adjustment of either roll end separately or both together.

32"x92" four-roll, Z-type calender, specially developed for high-speed, high-precision production of plastic film and for fabric coating.



30"x54" two-roll asphalt tile calender proportioned for great strength and resistance to deflection. Gearing is enclosed in a separate uni-drive.



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QUALITY IS ALWAYS THE SAME

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For 27 years PARA FLUX has been the Standard of the Rubber Industry, its quality is always the same whether you are a drum or tank car user.

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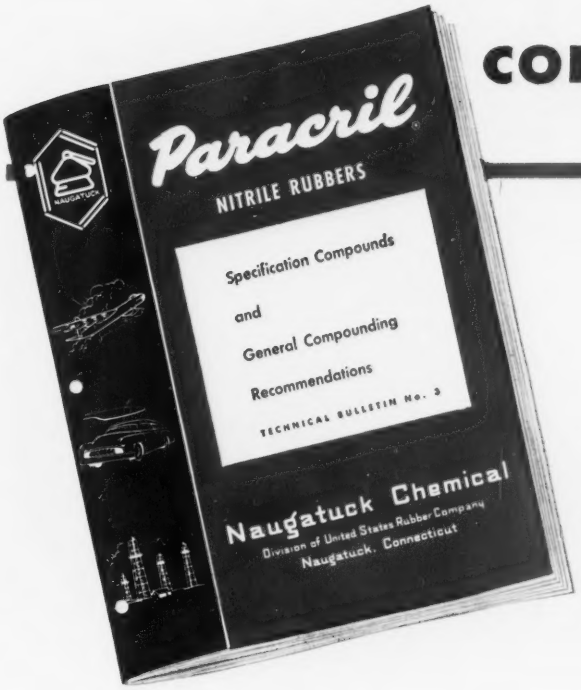
Catalogued for compounders



Here is a ready reference book compiled to give you numerous specification compounding facts about the amazingly versatile chemical rubber — Paracril. Its 36 pages provide complete information as to how the various Paracril compounds withstand specified oil, fuel, solvent and temperature requirements.

Existing Paracril compounds meet many of the requirements of industry today. The data compiled in this book may also serve as a basis for the development of other Paracril compounds tailored to fit your specific needs.

To get your free copy of this valuable booklet, fill in coupon below and mail to Naugatuck Chemical, 139 Elm Street, Naugatuck, Connecticut.

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Naugatuck Chemical, 109 Elm St., Naugatuck, Conn.
Please send me your valuable 36-page booklet No. 3,
"Paracril — Nitrile Rubbers"

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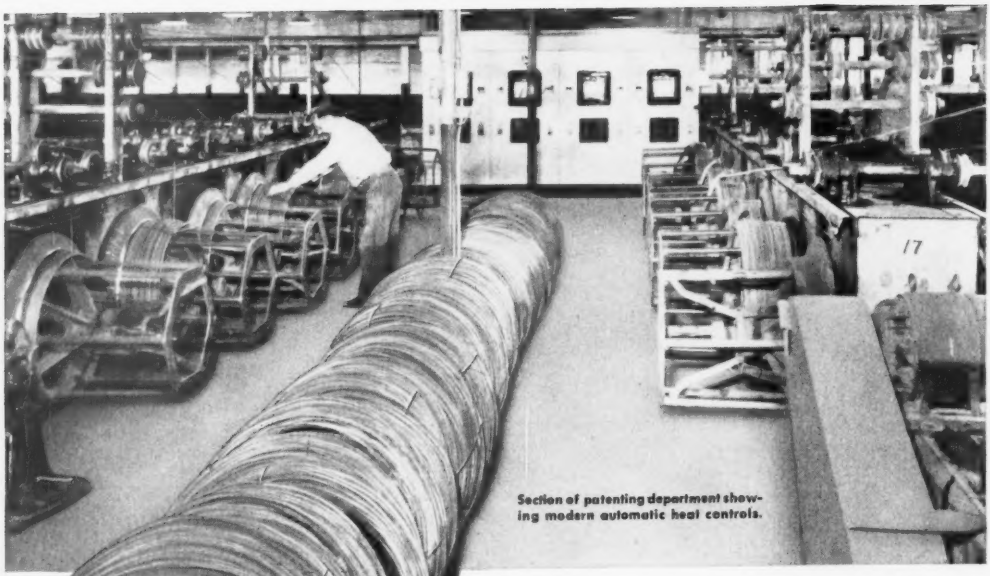
Company .....
Address .....
City ..... Zone ..... State .....

Naugatuck Chemical NAUGATUCK, CONNECTICUT
Division of United States Rubber Company

IN CANADA: NAUGATUCK CHEMICALS DIVISION • Dominion Rubber Company, Limited, Elmira, Ontario
Rubber Chemicals • Aromatics • Synthetic Rubber • Plastics • Agricultural Chemicals • Reclaimed Rubber • Latices



Section of patenting department showing modern automatic heat controls.

wire control

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• The accuracy with which your wire specifications are met, *and held,* quite naturally has an important bearing on the cost, speed and quality of your production. That's why you can profit by National-Standard's facilities and exceptional experience in producing fine wire of many metals and alloys for exacting needs.

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Remember, too, another National-Standard policy that can work to your advantage—highly qualified engineering service in the development and application of special wire to solve special problems. As always, it's yours for the asking.

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REYNOLDS WIRE.. *Dixon, Illinois*	Industrial Wire Cloth
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WORCESTER WIRE WORKS.. *Worcester, Mass.*	Round and Shaped Steel Wire, Small Sizes

AZO-ZZZ-55 zinc oxide

AZO ZZZ-55

Uniform particle size and absence of extreme "fines" assures good dispersion and easy processing.

*

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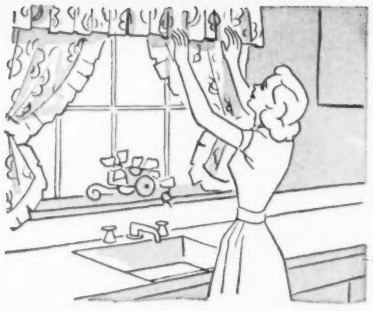
1. For high translucence. "Dutch Boy" Plumb-O-Sil C has a refractive index that closely coincides with that of vinyl chloride resin. That's why Plumb-O-Sil C assures highly translucent stocks for a wide variety of products.



2. For better color. "Dutch Boy" Plumb-O-Sil C stabilizer has no appreciable tinting strength. You get good stability in deep shades and vivid colors because Plumb-O-Sil C performs well with almost all dyes and pigment additions.

Stabilize your translucent vinyl stock

with "Dutch Boy"

PLUMB-O-SIL C

3. For easier dispersion. "Dutch Boy" Plumb-O-Sil C needs *no* pre-dispersion. You get heat stability with less work and trouble in processing.

If you have a special problem in stabilizing your translucent vinyl compounds, consult our technical staff. They will be glad to help you. Or write for additional information and technical data on "Dutch Boy" Plumb-O-Sil C.

"Dutch Boy" Stabilizers

PRODUCT	USE
TRIBASE (Tribasic Lead Sulphate)	Electrical and other compounds requiring high heat stability
TRIBASE E (Basic Lead Silicate Sulphate Complex)	Low volume cost insulation
DS-207 (Dibasic Lead Stearate)	Stabilizer-lubricant for sheeting, film, extrusion and molded compounds
PLUMB-O-SIL A (Co-precipitate of Lead Orthosilicate and Silica Gel)	Translucent and colored sheeting and upholstery stocks
PLUMB-O-SIL B (Co-precipitate of Lead Orthosilicate and Silica Gel)	Translucent and colored film, sheeting, belting
PLUMB-O-SIL C (Co-precipitate of Lead Orthosilicate and Silica Gel)	Highly translucent film and sheeting
DYTHAL (Di-basic Lead Phthalate)	General purpose stabilizer for heat and light. Good electrical properties
DYPHOS (Di-basic Lead Phosphite)	Outstanding for heat and light in all opaque stocks including plastisols and organosols. Exceptional weathering characteristics
NORMASAL (Normal Lead Salicylate)	As stabilizer or co-stabilizer in vinyl flooring and other compounds requiring good light stability
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Dutch Boy* CHEMICALS

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R. D. Wood 3400-ton two-opening steam platen press for vulcanizing and curing rubber composition sheet packing, floor tile, and rubber belting.

You get from an R. D. Wood hydraulic press *engineered performance*—year after year!

You get this proved performance because R. D. Wood hydraulic presses are very carefully designed and built—with only the finest materials used in their construction.

You get this performance—with all its obvious economies—because 150 years of manufacturing experience go into each piece of R. D. Wood equipment.

Whatever your hydraulic press needs or problems might be, get in touch with R. D. Wood engineers. Let them show you how *performance* makes a Wood press a good press.

HYDRAULIC PRESSES AND VALVES FOR EVERY PURPOSE ... • INTENSIFIERS

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CUT MILLING COSTS WITH OUTSTANDING PROCESSING

POLYMEL D

a solid, friable, styrene-indene copolymer resin

HIGHLY EFFECTIVE IN SMALL QUANTITIES

REDUCES DEFECTIVES AND BLISTERING

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EXTENDER FOR STYRENE HARDENERS

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HIGH DIELECTRIC PROPERTIES

DETACKIFIES HIGHLY LOADED STOCKS

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HIGHLY ADVANTAGEOUS IN GR-S COMPOUNDING. EXCELLENT PROCESSING FOR ALL HIGHLY LOADED BATCHES

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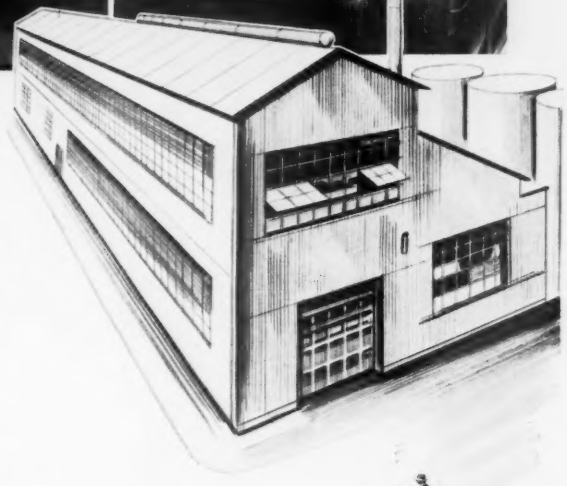
NEW COLUMBIA-SOUTHERN RUBBER PIGMENT LABORATORY

Milling rubber pigment compounds in the new rubber development laboratory.



This brand new Columbia-Southern Rubber Pigment Laboratory at Barberton, Ohio, is part of the Company's intensive pigment expansion program.

This laboratory will focus attention on two important activities, namely, quality control and the development of new and better pigments for the rubber industry.

Here continuing research will be conducted into the Columbia-Southern pigments—Calcene TM, Calcene NC, Silene EF and Hi-Sil. These pigments have made major contributions in recent years to better compounding and performance of natural rubber, GR-S, butyl and Neoprene, at reduced volume cost. New uses for these outstanding pigments are developed periodically which point the way for even greater potentials in the future.

Information concerning the application of these rubber pigments, developed by Columbia-Southern's research group, is made available to those interested through pigment data bulletins. You are invited to add your name to our mailing list.

Columbia-Southern is the originator and sole producer of these four rubber reinforcing pigments:

CALCENE TM **CALCENE NC**

SILENE EF **HI-SIL**

COLUMBIA-SOUTHERN

COLUMBIA-SOUTHERN CHEMICAL CORPORATION

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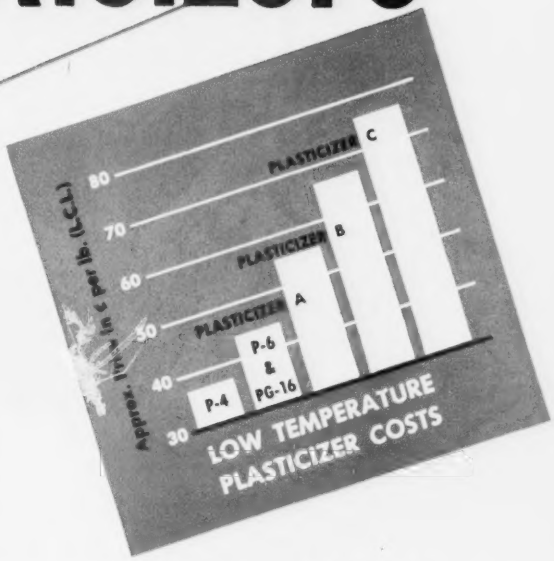
1000 Marquette Bldg. • Detroit 26, Michigan

HOW TO CUT COSTS ON LOW TEMPERATURE / LOW VOLUME SWELL

Plasticizers



Ricinoleates are fully equivalent and, in many cases, superior to the commonly used low temperature plasticizers. An added feature is their extremely low volume swell in aromatic fuels. Their cost is much lower. Check this graphic comparison and you will see that costs can be cut substantially.

Baker Ricinoleate Esters:

PG-16, Butyl Acetyl Polyricinoleate	25% Nitrile Rubber
FLEXRICIN® P-4, Methyl Acetyl Ricinoleate	40% Nitrile Rubber
FLEXRICIN P-6, Butyl Acetyl Ricinoleate	Neoprene GN
FLEXRICIN P-4, Methyl Acetyl Ricinoleate	GRS

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Please send samples of the Ricinoleate Esters checked or Technical Bulletin.

☐ **PG-16** ☐ **P-4** ☐ **P-6**

☐ **Technical Data**

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Use these Specially-Designed **U. S. RECLAIMS**

that improve your quality and lower your costs!

Every tire manufacturer recognizes those two demons HEAT and OZONE and knows how harmful they can be to his products.

If these two bugaboos are plaguing you, here's a tip that may solve your problems once and for all. Many of our customers have found that three of our reclaims impart characteristics to sidewalls that make them a lot less susceptible to the ravages of heat and ozone. U. S. Reclaims #R-351, #2017 and #2026, used in sufficient quantities in your compounds, will add the right kind of RESISTANCE to these two terrors and still give you the compounding and processing economies you have learned to expect from U. S. Reclaims.

Let us send you all the facts and tell you the full advantages connected with using *substantial* quantities of these *finer* U. S. Reclaims in your tire compounds.

Always keep reclaims in your formula and always look to U. S. for the best. U. S. Rubber Reclaiming Company, Inc., P. O. Box 365, Buffalo 5, N. Y. Trenton agent: H. M. Royal, Inc., 689 Pennington Avenue, Trenton, N. J.

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2. PROTOX-167	Slow	4	XX-4
3. PROTOX-168	Fast	8	Fine-Particle French Process
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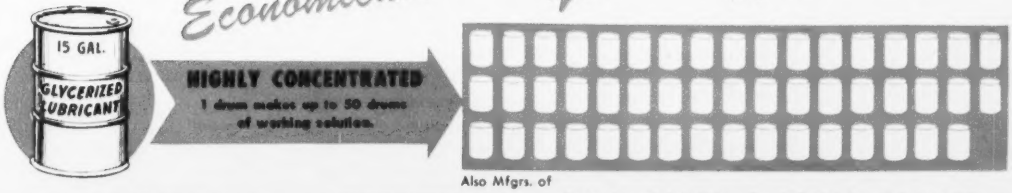

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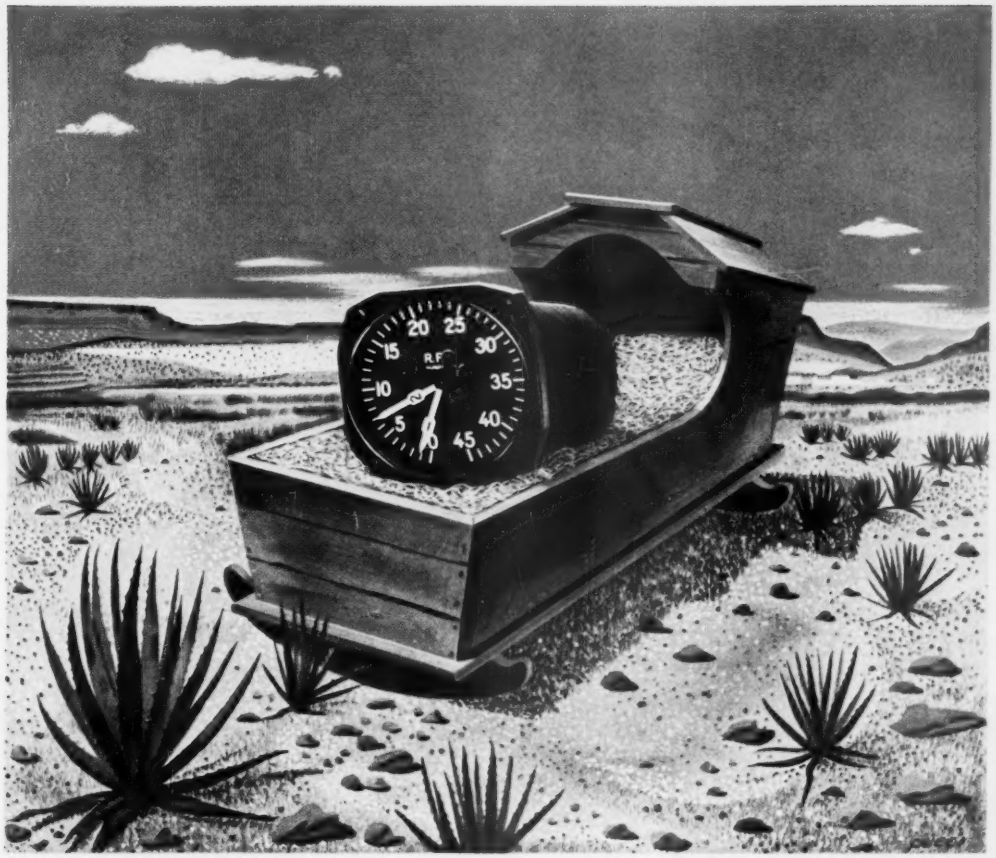

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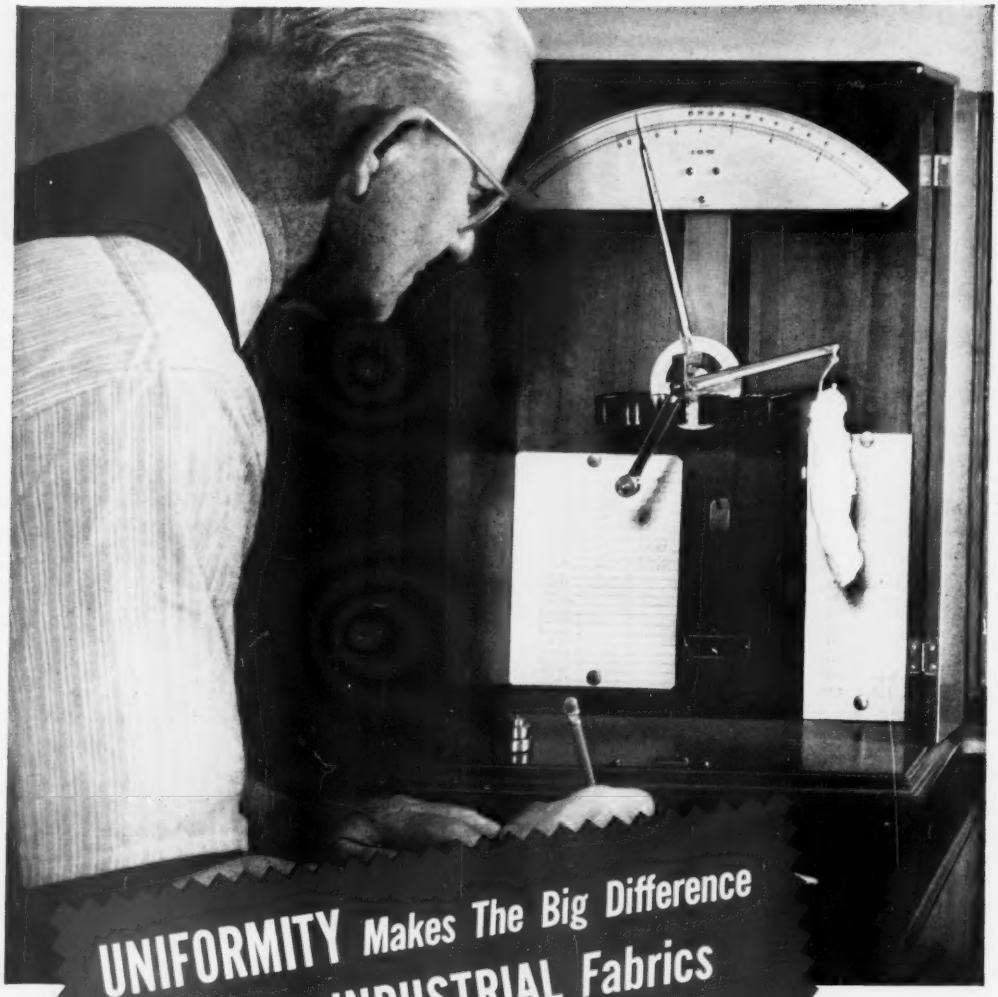

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GR-M		100.00			
Hycar OR-15			100.00		
Paracril-B				100.00	
GR-S					100.00
Zinc Oxide	5.00	5.00	5.00	5.00	5.00
E.L.C. MgO	—	4.00	—	—	—
S.R.F. Black	50.00	—	100.00	100.00	60.00
E.P.C. Black	—	50.00	—	—	—
Stearic Acid	1.50	1.00	1.00	1.00	0.50
BTDS (a)	1.00	—	1.50	1.50	1.25
TMTDS (b)	.10	—	—	—	.20
Sulfur	3.00	—	1.50	1.50	1.75
TP-90B	30.00	20.00	30.00	30.00	30.00

(a) Benzothiazyl disulfide
(b) Tetramethyl thiuram disulfide

Cure	30/310°F	45/300°F	30/310°F	30/310°F	30/310°F
Tensile	2200	2600	2380	2250	1500
Elongation	530	410	300	350	380
Durometer	42	68	70	61	45
**Low Temperature Flexibility	—95°F	—70°F	—70°F	—80°F	—95°F

**Low temperature flexibility was measured using a modified torsional tester devised by U. S. Rubber Company. The temperatures shown are the values at which the absolute moduli is 10,000 pounds per square inch. G 10,000 value is taken as the stiffening point although the specimens were still quite flexible.

For technical information write:

This information is believed to be accurate. However, no warranty is expressed or implied regarding the accuracy of these data, or the use of this product.

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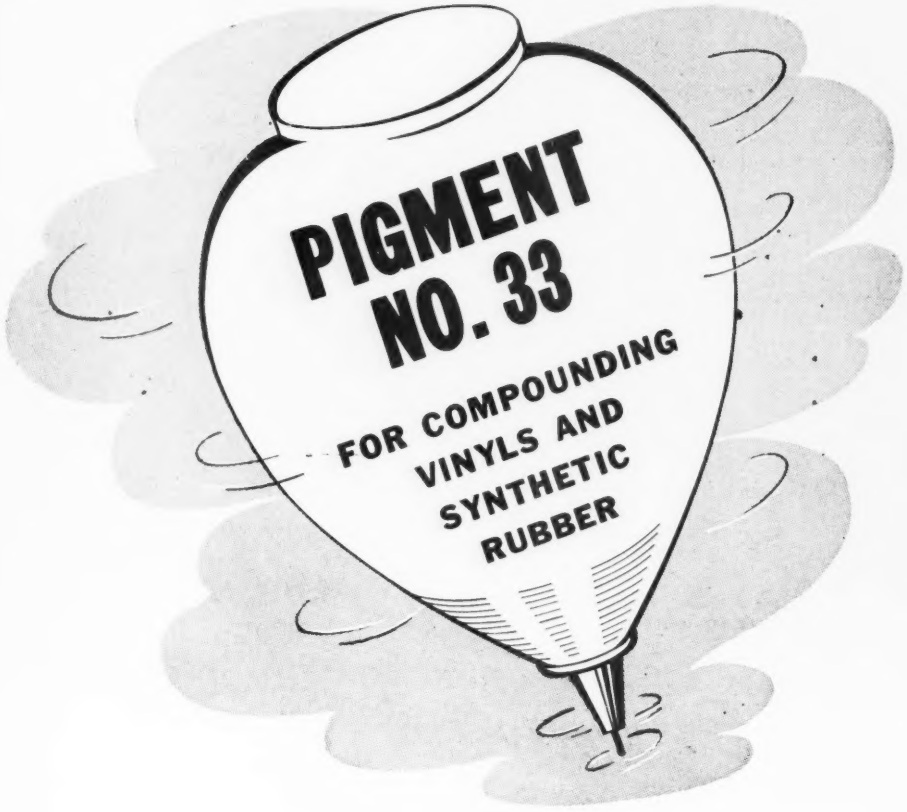

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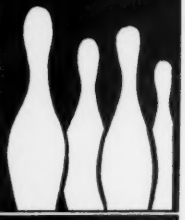

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In natural rubber—Unprotected Compound A started to crack in 5 hours. Compound B, containing 1½ parts of Santoflex B on 100 parts of rubber hydrocarbon, ran 23 hours before cracking. Test continued for 214 hours.

In GR-S (LTP)—Compound A, unprotected, started cracking in 16 hours. Compound B, containing 1½ parts of Santoflex B on 100 parts of GR-S, did not crack until 43 hours. Test was run a total of 140 hours.

Samples were flexed in an ozonized chamber using the standard test atmosphere of 25 parts ozone per 10^8 parts air.

Specifications

	Appearance	Ash	Insolubles (benzene)	Specific Gravity
SANTOFLEX B 1,2-dihydro-2,2,4-trimethyl-6-phenylquinoline	Dark, waxy lumps	0.1% max.	Trace max.	1.11 @ 25° C.
SANTOFLEX BX Blend of 85 parts Santoflex B and 15 parts N,N'-diphenyl-p-phenylenediamine	Dark, waxy lumps	0.3% max.	1% max.	1.12 @ 25° C.
SANTOFLEX 35 Blend of 65 parts Santoflex B and 35 parts N,N'-diphenyl-p-phenylenediamine	Dark, waxy lumps	0.5% max.	1.5% max.	1.14 @ 25° C.

For information on these and some two score other Monsanto Chemicals for rubber, write for the 46-page, file-size booklet, "*Monsanto Chemicals for the Rubber Industry*," or contact MONSANTO CHEMICAL COMPANY, Rubber Chemicals Sales, 920 Brown Street, Akron 11, Ohio.

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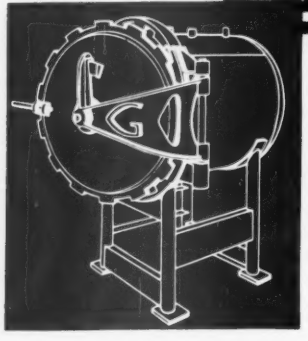

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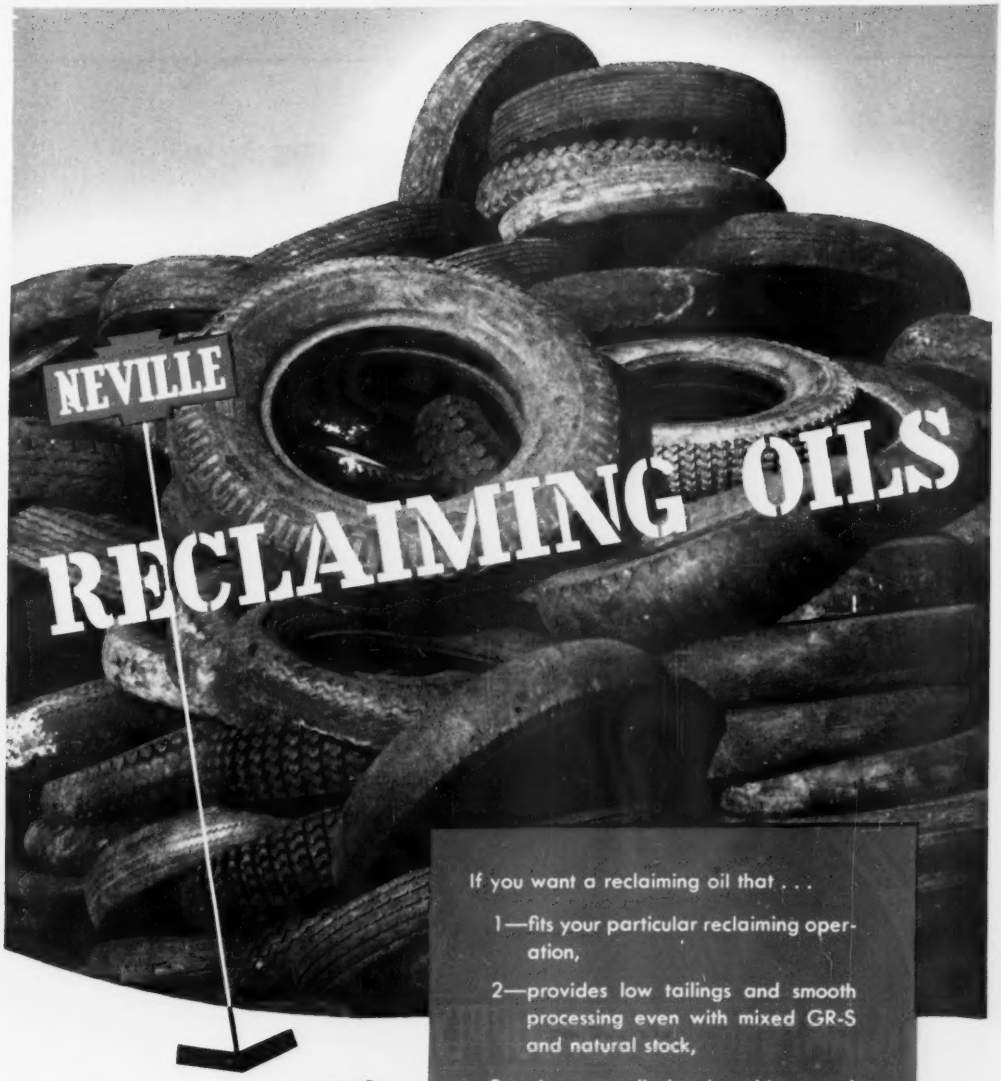

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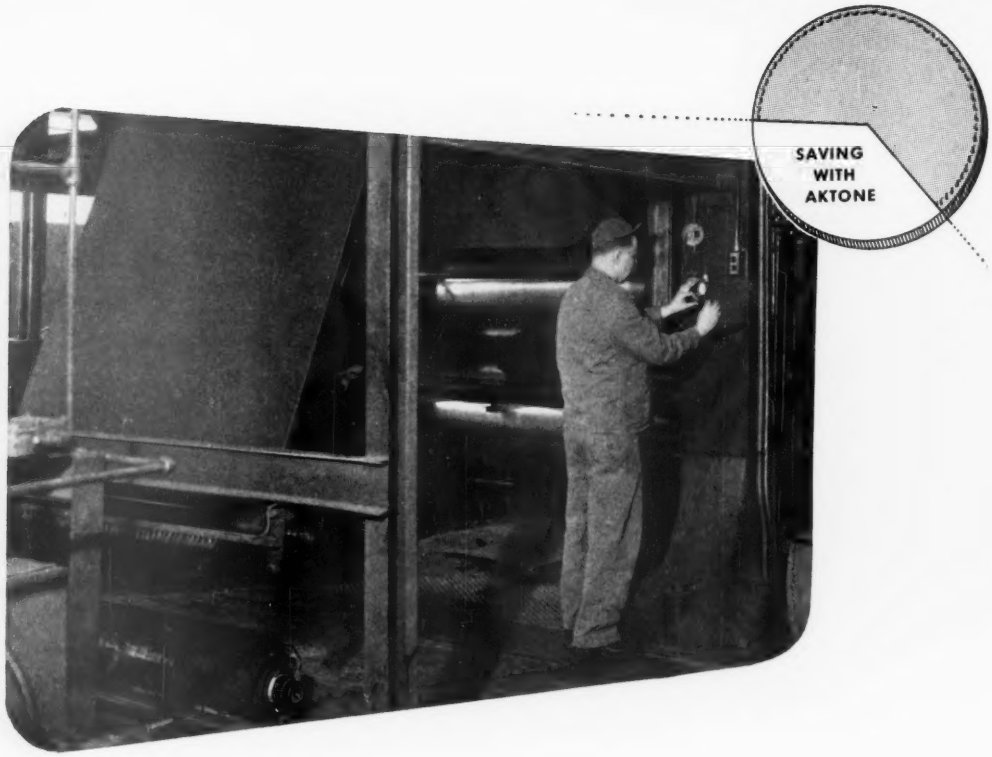

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Whole Tire Reclaim	30.6	Antioxidant	1
ESSEX (SRF) Black	25	Sulfur	2.75
Stearic Acid	0.5	MBT	0.75
Zinc Oxide	3	AKTONE	0.75

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VOLUME 71
NUMBER 6

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CONTENTS FOR SEPTEMBER, 1952

A Water Bomb for Studying the Oxidation of Elastomers —*By H. H. Gillman and William M. Haines, Jr.* 767

Report on Tire-Building Machine and Other Accidents ... 772

Fiber-Free Rubber for Reclaim—*By Thos. B. Dorris* 773

The Surface Coating and Impregnation of Fabric (Concluded)—*By C. A. Litzler* 781

REGULAR DEPARTMENTS

Book Reviews	822	Los Angeles News	812
Canadian News	810	Names in the News	801
Chemical Prices	*	New Equipment	816
Classified Ads	835	New Goods	—
Coming Events	798	Obituaries	814
Editorials	787	Rubber, Cotton Markets..	826
Financial News	802	Statistics	828

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By Royce J. Noble, Ph.D.
Text Book on Latex

LATEX AND ITS INDUSTRIAL APPLICATIONS (Vol. I)
(Out of Print)
By Frederick Marchionna
Bibliography of latex patents and literature to June, 1932.

LATEX AND RUBBER DERIVATIVES AND THEIR INDUSTRIAL APPLICATIONS (Vols. II & III)
By Frederick Marchionna
Bibliography of latex patents and literature from June, 1932, to January, 1937; rubber derivatives to January, 1937.

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RUBBER AGE

Vol. 71, No. 6 SEPTEMBER, 1952

A Water Bomb for Studying the Oxidation of Elastomers

By H. H. GILLMAN and WILLIAM M. HAINES, Jr.

Gates Rubber Company, Denver, Colorado

The Water Bomb detailed in the accompanying paper must be considered as still being in the experimental stage while the method and results discussed do not represent the ultimum. The best operating details have not been worked out, the limitations are not yet known, and the reproducibility and accuracy are still subjects for experimentation. Nevertheless, the method is unique in presenting new types of information and is also of value in aging practical rubber stocks such as water bags, steam hose, neoprene compounds, etc., which are very little affected by conventional aging methods and, therefore, present difficulties in knowing when these compounds have been improved. It was because of these initial findings that the authors prepared the paper for presentation and it is being published in its present form because of its potential importance to the industry.—EDITOR

THIS paper presents a combined method for scientific research on the oxidation of elastomers and an accelerated aging test for practical rubber technology. The proposed Water Bomb method extends present frontiers on the subject of oxidation and also permits new measurements not heretofore available. The authors believe the Water Bomb method is unique in studying the most useful oxidation range in rubber technology by partial solution oxidation. This technique is a modification of the complete solution oxidation, resulting in chain cleavage to relatively simple hydrocarbons, employed in classical researches on the rubber molecule.

The classical systems of studying oxidation have been direct oxygen absorption measurements made by gravimetric, manometric, or volumetric methods. These suffer a number of limitations: sample thickness limits oxygen diffusion; sensitive pressure regulating devices are needed to adjust for decreasing oxygen pressure; relatively long test time; experimental conditions are limited to the temperature and pressure boundaries of glass equipment. In the Water Bomb, pressures and temperatures are restricted only by the structural characteristics of the steel vessel. For added flexibility the method allows testing in the presence of various atmospheres and surrounding conditions.

The practical methods of measuring deterioration of vulcanizates by oxygen are the well known Geer Oven, Bierer-Davis Oxygen Bomb, and the U. S. Rubber Air Pressure Bomb. Here, again, the Water Bomb extends the range of experimental conditions and reduces the time factor. The results can be expressed in fundamental units, thus avoiding the usual experimental errors inherent in rubber physical property measurement. Most important, though, the experimental aging conditions can be adjusted to degrade polymers that show only minor changes by standard aging methods.

The Water Bomb method submerges rubber samples in water in a heated, stirred autoclave. Oxidizing agents, or various modifying materials, are injected at desired intervals. Portions of liquid are taken by use of a sampling tube and titrated for residual oxidizing power. Any other solution properties can be also measured. Cured plates or dumb-bell specimens are similarly treated in the Water Bomb for standard stress-strain measurements.

Note: This paper was presented before the Division of Rubber Chemistry, A.C.S., Cincinnati, Ohio, May 2, 1952.

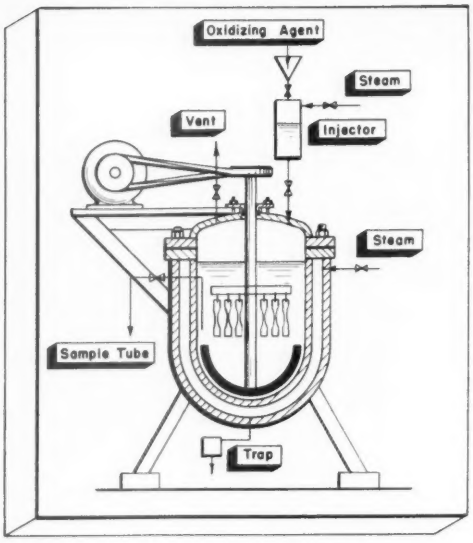

FIG. 1—Reaction vessel.

Experimental Procedure

A 21-liter, mild steel, steam-jacketed autoclave (Fig. 1) of 25 cm. cross section, equipped with an agitator, sampling tubes above and below the liquid level, and chamber type steam injector, was used in this work. (The authors have also used a vessel one-fifth this size with equal success. The vessel dimensions are not critical if only a fractional amount of liquid is withdrawn for titration.) The autoclave was charged with 4000 ml. of water and 500 gm. of cured stock either plates or ground on a Wiley mill to 4-40 mesh. The kettle was sealed and jacket steam and agitator turned on until an internal temperature of 198° C. was reached (approximately 20 minutes). Air was flushed out of the dome by bleeding the vent after 100° C. internal was reached.

Approximately twenty grams of potassium chlorate as a 10% solution was injected into the vessel by the steam injector. Immediately a sample of liquid was withdrawn for analysis of initial concentration of oxidizing agent. This time is designated as zero time in the data. Other samples were withdrawn at half-hour intervals.

The residual oxidizing power of the potassium chlorate solution was determined as follows: Ten ml. of the filtered solution from the autoclave were added to a flask containing 10 ml. of concentrated hydrochloric acid and 10 ml. of 10% potassium iodide solution. The solution was then titrated with 0.1 *N* sodium thiosulfate solution using starch solution indicator. It was usually necessary to warm the flask during titration. The oxygen equivalent is calculated in the usual manner.

Measurements of volatile decomposition products which collect in the dome were made as follows: The valve leading into the top of the vessel was opened slightly and the steam and gas were led into acidulated water. The steam condensed out and the gas bubbles were collected over water using an inverted water-filled bottle. The gas sample was then led into a standard Orsat type apparatus and analyzed by usual techniques for percentages of carbon dioxide, oxygen, and carbon monoxide.

For the aging tests, cured plates were placed in the vessel, subjected to oxidation conditions, taken out, dried, and then tested for stress-strain properties according to ASTM procedures.

The provision for injecting materials has these advantages: Temperature equilibrium is established before oxidation begins, thorough agitation is ensured by the cool liquid condensing steam in the vapor phase, and conditions may be modified as the reaction proceeds. The sampling devices in both liquid and gas phases provide flexibility in following the reaction at any desired intervals. While $KClO_3$ was used in this work, other oxidizing mediums can be employed.

Oxidation Studies

The compounds used in the initial runs, together with their physicals, are shown in Table I. A blank determination was first made to assure stability of the system. The titration for residual oxidizing power remained constant within the limits of experimental error.

To test the feasibility of the proposed method a run was made (Table II) with the rubber tread (Stock A) with added sulfuric acid to bring the pH to a value of 3. Based on prior experience by the authors, significant oxidation would take place.

In determining the kinetics of the oxygen consumption, the linear rate [Column III in Table II (zero order)], established by other investigators, gave a poor fit to the experimental data. However, the agreement of the log rate (Column V) of oxygen consumption is substantially constant (see also Fig. 4) and lends support that these observations conform to an apparent first

TABLE I—COMPOUNDS USED IN THE INITIAL RUNS

	A	B	C
Smoked Sheets	100.0	——	100.0
GR-S	——	100.0	——
EPC Black	45.0	45.0	——
Zinc Oxide	5.0	5.0	5.0
Stearic Acid	1.5	1.5	1.5
Sulfur	2.0	2.0	2.0
MBTS	1.5	1.5	1.5
DPG	0.25	0.25	0.25
Cure at 280° F.	75 Min.	75 Min.	50 Min.
Tensile Strength (lbs./sq. in.)	3700	2700	3800
Modulus at 500%	1600	2200	750
Elongation at Break (%)	590	590	740
Durometer	59	64	36

TABLE II—OXIDATION RATE OF RUBBER TREAD—STOCK A

(Temp., 198°C.; 4% $KClO_3$ on Compound; pH, 3)

I	II	III	IV	V
Time Min.	Mol O_2/Liter In Solution*	Linear Rate O_2 Consumption	Log Mol O_2/Liter In Solution	Log Rate O_2 Consumption
0	0.0268	——	0.428-2	——
30	0.0112	0.0156	0.049-2	0.379
60	0.0058	0.0054	0.764-3	0.286
90	0.0026	0.0032	0.415-3	0.349
120	0.0012	0.0014	0.079-3	0.336

* Oxygen in all cases is the oxygen equivalent of the chlorate involved.

TABLE III—TEMPERATURE COEFFICIENTS FROM THE LITERATURE

Reference	Author	Temperature °C.	Temperature Coefficient
(3)	Ingmanson	70-85	2
(4)	Ingmanson	60-80	2.38
(2)	Bierer	60-75	2.41
(7)	Neal	70-80	1.6-3.5

Note: A more complete list of temperature coefficients will be found in (8).

order reaction rate pattern. All the remaining work substantiates the first order oxidation pattern.

The rest of the experiments reported were carried out at a pH of 6.4 to obtain somewhat milder oxidizing conditions. Fig. 2 shows the increase in oxygen uptake of the rubber tread compound versus a gum type compound (Stock A vs. Stock C). These data on rubber are in agreement with Winn *(12)* who found that carbon black is a catalyst for the oxidation of GR-S vulcanizates.

To further test the validity of the proposed method a run was made on Stock A at a 10° C. lower interval. As expected, the oxidation rate is lower (see Fig. 3):

$$K = \frac{1}{t} 2.3 \log \frac{a}{(a-x)}$$

where a = initial O_2 concentration,
x = mols O_2 consumed,
a-x = mols remaining at time t, and
K = velocity constant.

In this case the velocity constant for 198° C. calculates 3.68×10^{-3} and at 188° C. it is 1.31×10^{-3}. The temperature coefficient then is 2.8, which is in the range of previous investigations (see Table III). The temperature coefficient of 2.8 agrees with the Shelton and Winn 2.6 *(10)* for the constant rate (zero order) condition but not with their higher value (3.9) for the initial reaction (first order). The authors emphasize that the data shown here are first order throughout.

As previously mentioned, the pH of the surrounding medium influences reaction rate. Fig. 4 shows the

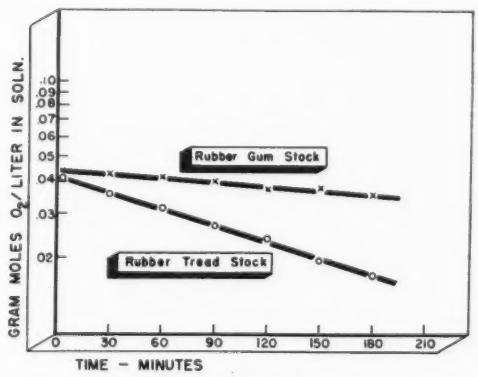

FIG. 2—Compounding variables—carbon black.

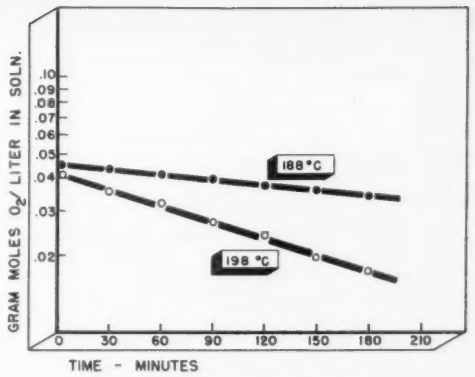

FIG. 3—Reaction rate variables—temperature.

constantly increasing rate with decrease in pH. On the alkaline side (pH 8) substantially no oxidation takes place under these conditions. This pattern differs from McGavack's work *(5)* who found there is a maximum oxygen absorption by natural latex at a pH of 10 with a falling rate at either side.

Not only pH but soluble salts as well affect the rate. Iron has been found *(1)* to affect the aging of GR-S and in the Water Bomb as well traces of iron salts markedly increase the oxygen uptake of either rubber or GR-S.

The behavior of the GR-S tread stock is shown in Fig. 5, and as is well known, the oxidation rate is less than for natural rubber. The pattern of volatile oxidation products of rubber (Stock A) and GR-S (Stock B) tread stocks are similar as demonstrated in Table IV. The combined oxygen data has been rearranged in Table V in a form more useful for comparison with other investigators. It is seen that the oxygen uptake of natural rubber is approximately threefold that of GR-S.

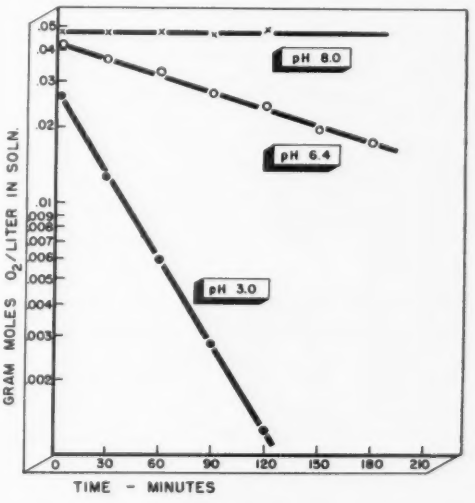

FIG. 4—Reaction rate variables—pH.

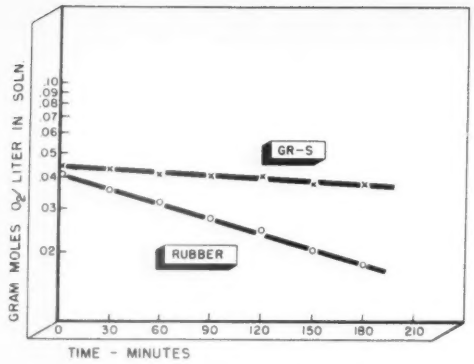

FIG. 5—Compounding variables—polymer type.

Accelerated Aging Test

Aging measurements made on the stress-strain characteristics of the rubber and GR-S tread stocks in the Water Bomb are shown in Fig. 6. The left side of the charts show changes in tensile strength, elongation, and hardness with time of aging. As expected, natural rubber shows greater tensile strength deterioration than GR-S. The well known ratio of chain scission to cross linking for rubber and GR-S is demonstrated by the hardness (durometer) divergence.

These data are enlightening when the physical characteristics are plotted against the mols of oxygen consumed, as shown on the right side of Fig. 6. Here it is seen that for equivalent oxygen uptake GR-S deteriorates to a far greater extent than natural rubber. Inspection of Table V shows, however, that under identical conditions and time, the oxygen uptake of rubber is threefold that of GR-S.

Samples aged in the conventional Oxygen Bomb and Water Bomb for various intervals are shown in Tables VI and VII. Three hours' aging in the Water Bomb result in degradation equivalent to 8 days in the Oxygen Bomb.

It is generally accepted, after Williams and Neal *(11)*, that the absorption of oxygen is independent of oxygen pressure, i.e., a zero order reaction. Morgan and Naunton *(6)* confirm Williams' findings, but caution that "the zero order of the oxidation with respect to oxygen does not necessarily mean that there is a specific rate-determining reaction not involving oxygen, but rather that the kinetical consequences of the mechanism yield a formula for the rate of oxidation in which the concentration of oxygen does not appear."

Shelton and associates *(10)*, in work with the oxidation of GR-S and later with rubber, divide the reaction mechanism into three stages:

(1) Initial, of short duration: kinetically characterized by a diminishing rate reaction of first order.

(2) Intermediate, which covers the useful life of the vulcanizate: steady state reaction of zero order.

(3) Final, recognized by transition from elastomeric to resinous stage: autocatalytic which approaches an infinite rate.

In the work presented here, on the contrary, it has been found that the velocity constant is of the first order over most of the vulcanizate's useful life. Moreover, where Shelton *(9)* shows a drop in tensile of a Hevea black stock of 2900 psi (3900 to 1000) on the absorption of 20 ml. of O_2/gm. of polymer at 100° C., we find a corresponding drop (3700 to 825 psi) on the absorption of only 7.04 ml. of oxygen/gm. of RHC at 198° C.

This apparent anomalous behavior is explainable and is a logical extension of observations previously noted.

TABLE V—EXAMINATION OF COMBINED OXYGEN DATA

(Three hours in Water Bomb @ 198°C. with 4% $KClO_3$)

	ml. O_2 per gm. RHC (1)	ml. O_2 per gm. stock $\times$ fr. RHC (1)	ml. O_2 per gm. stock $\times$ fr.	mol O_2 per gm. RHC $\times$ fr.	Equiv. Ethylene mol O_2 (2)	Wt. % O_2 per gm. stock	Wt. % O_2 per gm. RHC
Rubber Stock A	4.55	7.04	18.5	28.7	51	0.5 %	0.92%
GR-S Stock B	1.45	2.25	3.9	9.1	180	0.19%	0.29%

(1) Corrected to 25° C. (2) For rubber the unit is CH_2 grouping; for GR-S combined butadiene-styrene of 76.5/23.5 grouping.

TABLE IV—GAS ANALYSIS OF OXIDATION RUNS

Time (Min.)	Rubber (% CO_2)	GR-S (% CO_2)
0	2	2.5
30	5	5.5
60	7	10.5
90	12	12.5
120	—	19
150	17	—
180	20.5	21

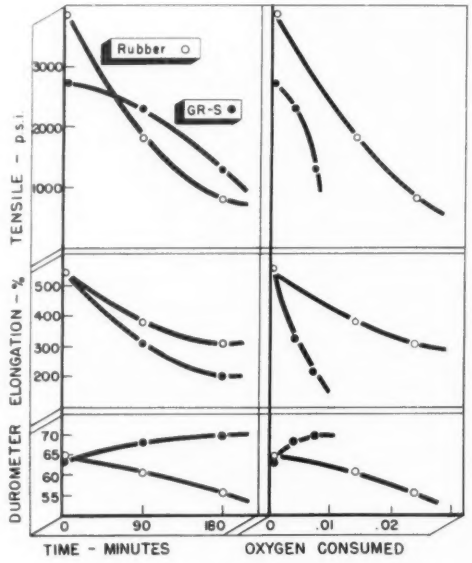

FIG. 6—Deterioration of stress-strain characteristics during oxidation.

Table VI—Water Bomb and Oxygen Bomb Aging of a Rubber Tread—Stock A

Time in Hours		
Water Bomb 198° C.	O_2 Bomb 300 psi 80° C.	Tensile (psi)
0	0	3700
—	24	2700
—	48	2300
1.5	—	1800
—	96	1500
—	144	1100
3	—	925

Table VII—Water Bomb and Oxygen Bomb Aging of a GR-S Tread—Stock B

Time in Hours		
Water Bomb 198° C.	O_2 Bomb 300 psi 80° C.	Tensile (psi)
0	0	2700
1.5	—	2300
—	48	2000
—	96	1800
—	144	1700
—	192	1600
3	—	1200

Morgan and Naunton *(loc. cit.)* found that the zero order reaction rate varies with temperature according to the Arrhenius equation but that deviation is to be expected in certain circumstances—including high temperature. The data presented in this paper at 198° C. is at a substantially higher temperature than previous investigations.

Comment

An outside reviewer has pointed out a possible fundamental objection to the method: That the reaction of molecular oxygen with rubber is considered to be a chain reaction of free radical nature whereas chlorate ion oxidations attack the double bond itself.

The authors' position is that the above statement may or may not be significant. They wish to reemphasize that all of the foregoing data on oxidation in physical property dovetails nicely with known facts about molecular oxidations. Any deviations can be explained as a resultant of particular conditions used.

Should it be later established that these oxidations in the Water Bomb are actually double bond reactions, then very simply this method presents a new technique for studying double bond reactions in rubbers.

Summary

A new method and apparatus are presented for studying the oxidation and aging of elastomers.

The method is partial oxidation in solution carried out in a sealed autoclave at 198° C. The results can be expressed in fundamental units by sampling the solution during the reaction and titrating. The corresponding polymer degradation is observed by stress-strain measurements on test plates.

Oxidation is found to be of first order in the useful oxidation range. The temperature coefficient is 2.8. Decrease in pH, addition of iron salts or of carbon black, increases the rate. Hevea rubber takes up three times the amount of oxygen that GR-S will under identical conditions. Per mol of O_2 consumed, however, GR-S degrades to a greater extent than Hevea rubber. Three hours in the Water Bomb at 198° C. is equivalent to 192 hours in the Oxygen Bomb at 80° C.

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McDonnell 202 Series Combination T & P Valves

A new line of temperature and pressure relief valves, for use on hot water tanks and heaters, has been announced by McDonnell & Miller, Inc., 3500 No. Spaulding Avenue, Chicago 18, Ill. Known as the 202 Series, these valves are actually a combination of two time-tested valves in one assembly. For the task of guarding against excessive pressure and temperature, they are said to offer considerable savings in cost and installation time. The new valves are of the automatic reseating type, and are Btu.-rated for proper selection.

For pressure relief the 202 Series utilizes the operating mechanism of the McDonnell 230 Series Valves, which were developed a short while ago to provide accuracy of operation at moderate cost. The pressure relieving capacities of the 202 Series are steam rated, and have been established by independent laboratory test according to the accepted procedure for such valves. This is said to represent the only feasible way to match discharge capacity of the valve to the Btu. output of the heater—to prevent over-pressure under any emergency, such as failure of the water supply, that could permit a steaming condition.

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Report on Tire-Building Machine And Other Accidents

SOME interesting reports of factory accidents, together with suggestions for preventive measures to eliminate similar accidents, were recently published in the *Goodyear Safety News*, safety publication of the Goodyear Tire & Rubber Co. A number of these reports follow herewith:

Tire-Building Machine Accidents: Case (a). While putting chafer on tire, employee had the chafer, which was coming from the reel at the employee's left, draped over his right shoulder. As he stepped on the starting pedal, the chafer caught on the tire and pulled the employee under the drum of the tire-building machine. He suffered serious head injuries.

Case (b). Tire builder was putting sidewall on tire when the sidewall became wrapped around his wrist. He was pulled under the machine and suffered four broken ribs and other chest injuries.

Preventive Measures: (1) Tire builders should be constantly instructed to never permit sidewalls, chafers, treads, etc., to become wrapped around their arms, neck, shoulders, or other parts of their bodies when starting them on the tire. (2) The controls on tire-building machines should be checked frequently to see that they are operating satisfactorily. (3) The providing of pedal guards on tire-building machines will decrease the hazard of accidentally stepping on the starting-pedal before the tire builder is ready.

Industrial Truck Accidents: Case (a). Employee was backing his truck out of an elevator. Another truck driver was driving his truck down the aisle in front of the elevator landing. The trucks collided and the one driver suffered a severe hand injury that necessitated the amputation of the thumb. Both drivers were facing in the opposite direction to that in which the trucks were traveling.

Case (b). Employee was driving lift-truck down aisle that was partially blocked by a skid loaded with stock on one side and by an empty skid on the other side. As the moving truck went between the skids, the driver turned the truck slightly, causing it to catch the empty skid. Another employee was caught by the empty skid and his legs were crushed between the skid and the wall. The operator of the truck was not a regular truck driver.

Case (c). As employee drove truck into elevator car, he failed to apply his brakes early enough to prevent catching another employee between truck and side of elevator car. Employee suffered broken rib and other chest injuries. Operator of truck was not an authorized truck driver.

Case (d). Truck operator was not facing the direction in which he was traveling, and as a result ran into a tray skid, crushing another employee between the other end of the skid and a water fountain.

Preventive Measures: (1) Truck operators should be supervised closely to see that they operate their equipment safely. Operators should always face the direction in which they are traveling, and should use special care around elevators. (2) Only authorized truck drivers should be allowed to operate trucks. Use of special badges and training courses for drivers is advantageous. (3) Periodical inspections should be made of all trucks and transveyors. An inspection form should be completed and signed by the inspector for each such inspection. (4) Aisles should be kept clear of skids, tires, pieces of equipment, and any other materials or objects that are not being moved. Aisle lines should be painted regularly.

Solvent Vapors: Employee was assigned to clean a large trichlorethylene vapor degreasing tank from which all the solvent had not been drained. He soon became groggy and climbed out several times to get fresh air. The third time, he was so dizzy from the solvent vapors that he fell back into the tank from the ladder. Fortunately, his helper, who had remained outside, was able to assist him from the tank.

Preventive Measures: (1) Before workers enter any tank which has contained toxic or explosive materials, care should be taken to thoroughly drain the contents and purge the tank with air or steam, or both. Tests should be made to ascertain the safety of entering. (2) Air-supplied respirators or sufficient forced ventilation should be provided while employees are in such tanks. (3) No employee should enter a tank without a helper watching from the outside.

Calender Accidents: (a). A member of the calender crew, while feeding the liner between the bottom and middle roll, had a piece of rubber catch his finger and pull his arm into the bite of the rolls. The opening between the bottom and middle rolls, at the time, was approximately 1½ inches. The muscles of the arm were torn to a distance of 5 inches above the wrist. The safety stop worked satisfactorily when pulled.

Case (b). Left hand was caught under bottom calender roll, between calender roll and conveyor belt. Left shoulder was fractured, hip dislocated, and other injuries were received.

Preventive Measures: (1) In many cases, the distance between rolls and rolls and conveyor belts can be adjusted to eliminate the hazard involved. If calenders are used only for running gum stock the two bottom rolls can be separated to a distance of 3 inches by the use of larger connecting gears. If gum stock or similar stocks are run exclusively, this measure should by all means be taken. If the calender is an all-purpose unit, it is not possible to install larger connecting gears and yet be able to run friction stock which necessitates having the rolls close together. In this case, it is suggested that a barrier guard be installed at the bite of the rolls. This guard should extend the length of the rolls and can be made of expanded metal to afford a clear view of the rolls. The width of the guard varies, but should be at least 6 inches. (2) Case (b) points out the necessity of using foresight in installing belt conveyors. In all probability the belt conveyor under this calender roll should have provided a "bite" clearance of at least three inches. A clearance of an inch or 1½ inches between rolls is more likely to cause an accident than when the clearance is very small. (3) All employees should be instructed to keep their hands away from pinch points while equipment is in operation.

Skin Rash: Employee curing tubes developed skin rash. Hot weather had encouraged greater exposure of skin, thus increasing chances for developing sensitivity to rubber chemicals.

Preventive Measures: (1) If possible, sleeves should be kept rolled down and gloves worn when handling tubes. (2) Good personal hygiene, including daily bath and change to clean clothing, should be encouraged. (3) Protective creams will assist in preventing skin contact with rubber chemicals.

Fiber-Free Rubber for Reclaim

By THOS. B. DORRIS*

Chief Chemical Engineer, Sprout, Waldron & Co., Muncy, Penna.

TIRE rubber substantially free from cellulose along with reclaimed fiber is now being produced in full scale installations. The process stems from a series of cooperative undertakings with the rubber industry going back to 1928. The unrestricted availability of such rubber and its fiber by-product seems destined to exert an important influence on the trends and economics of rubber reclaiming. To appreciate the significance of this development, certain aspects of the reclaiming industry itself must be first considered.

A second patent *(1)* issued to Goodyear shortly after his vulcanization disclosure a century ago covered the grinding of scrap rubber articles to crumb. Reclaiming has been inevitably linked with the development of the rubber industry ever since. Both were markedly influenced by the rapid expansion of the automobile industry after 1910, and again by the huge synthetic rubber industry created as a World War II necessity.

Pearl Harbor emphasized the importance of reclaimed rubber as a national resource. With more than 90% of the normal crude supply lost by 1942 and the synthetic industry just coming into being, a 20% increase in reclaim production was urged by the government. By 1943 the reclaim fraction of rubber consumed in this country had risen beyond 40%. In 1950 it was nearly 22% *(9)*.

In general, reclaimed rubber is used to augment and extend the virgin material. Many applications believed impossible for reclaimed rubber ten years ago have now become established practice. In other instances, reclaim has been found capable of replacing crude to the extent of 50% without an undesirable lowering of quality. The relative percentages in most formulas are varied within a workable range, depending largely on the market prices of reclaim and crude. Table I summarizes this condition.

The tremendous synthetic capacity in this country is ample to supplement the normal supply of plantation rubber if necessary. Table II suggests, however, that relative costs will always insure a maximum consumption of reclaim wherever it is suitable. For many purposes a good grade of reclaim is much preferred to a poor grade of crude rubber. In fact, the price of reclaim was actually higher than that of crude in 1932.

Tires and tubes account for about 75% of the natural and synthetic rubber consumed in the United States. The trend of annual variations is indicated in Table III. Conversely, used tires and tubes constitute the major source of scrap for reclaim. In view of this, any advance in the art of processing used tires is of prime importance to the rubber reclaiming industry.

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TABLE II—RUBBER PRICES AS OF DECEMBER, 1950 *(2)*

Type of Rubber	$/Lb.
Rubber, spot (N. Y. Commodity, 12/8 closing)	0.695
Synthetic:	
Butaprenes	0.46-0.56
GR-S	0.185
Neoprenes	0.38-0.80
Scrap:	
Mixed passenger tires	0.0125
No. 1 peelings	0.04
Tubes	0.12-0.18
Reclaims:	
Whole tires, peels	0.10-0.115
Inner tubes, natural	0.25-0.285
Inner tubes, butyl	0.125-0.13

Reclaiming Methods

Whatever the method of devulcanizing, the reclaiming of used tires may be said to start with sorting. In the wintertime there may be a 24-hour period of indoor storage to eliminate snow and ice which often is 15% of the outdoor stock weight. Subsequent steps may include:

1. Debeading or removal of the stiff wire reinforced inner rim.
2. Mechanical tread removal for sale as fiber-free stock (peel).
3. Removal of salable sections from the remaining carcass or its isolation for reclaiming the significant per-

TABLE I—PRODUCTION AND CONSUMPTION OF RECLAIMED RUBBER

Year	—Reclaim (Long Tons)— Produced	Consumed	Reclaim as % of Total Consumption
1922	57,834	54,458	15.4
1928	208,516	233,000	33.8
1932	75,656	77,500	18.9
1941	274,202	251,231	24.5
1942	285,007	254,820	40.4
1945	243,309	241,036	23.2
1949	224,029	222,679	18.3

TABLE III—RUBBER CONSUMPTION FOR TIRES AND TUBES

Year	Tire, Tube Rubber— Long Tons	% of U. S. Consumption
1920	150,000	76
1930	300,000	80
1941	520,000	68
1943	230,000	73
1945*	590,221	74
1949*	659,533	67

* All transportation products.

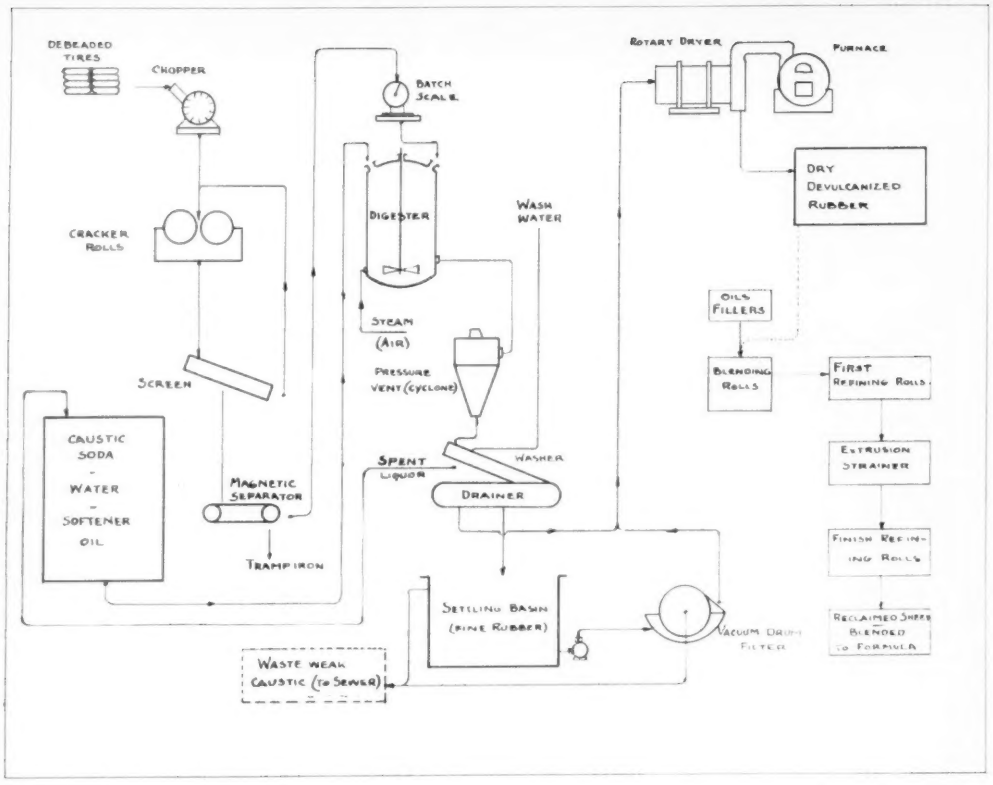


FIG. 1—Tire rubber reclaiming by caustic digestion.

centage of soft rubber embedded in the reinforcing cords.

The peelings contain virtually all of the stones and tramp metal picked up in road service. In general, this stock is more intensely vulcanized than the rubber associated with the carcass and may be more heavily filled as well. So great is this difference that some reclaimers prefer to devulcanize these fractions separately in the interest of a more uniform final product.

A large percentage of tires is reclaimed whole. The tire may be debeaded and then cut into coarse sections, or fed directly into heavy duty cracking rolls operating in a closed system with screens as well as magnets for removal of the bead wire. Screen openings vary considerably depending on the subsequent reclaiming procedure.

The predominance of autoclave over thermal and mechanical reclaim procedures is a measure of their adaptability to fiber-containing scrap. The majority of present-day installations are refined versions of the basic Marks patent (1899). These involve the destruction of cellulose and devulcanizing of rubber by digestion in the presence of alkali or a metal chloride.

Digestion of tires is depicted in Figure 1. A weighed batch (2 to 5 tons) of cracked tire stock is loaded into a steel digester, equipped for stirring. There follow softening and swelling oils, a certain amount of water and 4 to 8% of caustic (or equivalent metal chloride) solution. Depending on the treatment required, digestion proceeds for 3½ to 24 hours at a steam pressure of 160 to 350 psi. Bus, truck and other large heavy-duty tires may require longer periods. After digestion a portion of the caustic liquor is recovered. Finally, the stock is washed with water and dried.

To avoid a bottleneck, draining screens for removal of the wash water with its complement of chemicals and cellulose decomposition products may be no finer than 50 mesh. As much as 20% of digested rubber particles have been reported finer than this size. Enough of these fines are carried through the screens to justify the addition of a sedimentation tank and mechanical filter.

Spent digestion liquors may render the receiving stream unfit for drinking, destroy fish life, or infringe on the quality of water supplying downstream industries. Its pH may adversely affect the established mode of sewage treatment. With the ever-increasing emphasis being placed on eliminating stream pollution, these factors can lead (and have led) to damage suits or undesirable publicity.

The combined product is dried to a 3 to 5% moisture content. The cellulose content will range from 0.5 to 3% and higher, depending on the efficiency and control of the digestion process. The final blending and refining operations are thoroughly treated elsewhere (*3, 9*).

The acid process involves digestion in corrosion-resistant tanks with hydrochloric or sulfuric acid to decompose cellulose fibers. This is followed by thorough washing and neutralization to remove acidity and water-

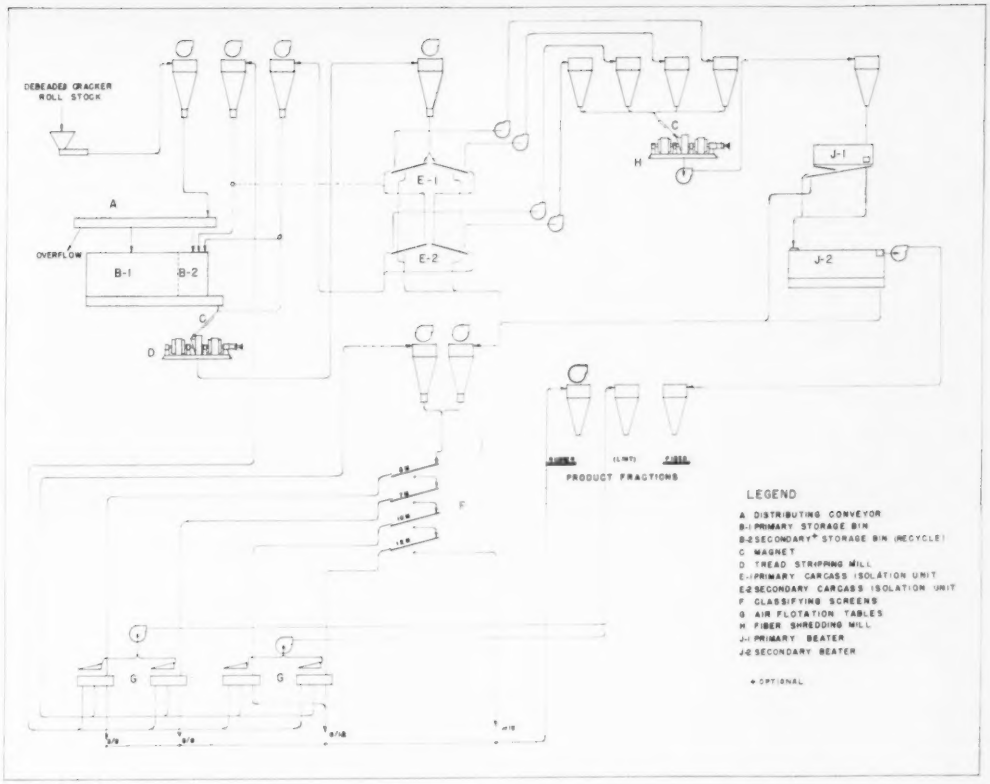


FIG. 2—Fiber-free rubber from used tires.

soluble decomposition products. The scrap is then dried and given a thermal treatment with steam and oils to complete devulcanization.

The pan process is applied chiefly to scrap which is low in fiber or has undergone acid treatment. A batch ground to pea-size is mixed with the necessary reclaiming agents, then placed in pans stacked in cars, and run into a horizontal cylindrical oven. Steam is applied at 100 to 185 psi for 4 to 6 hours to soften the rubber and decompose any cellulose present. After removal, the finished "biscuits" are ready for milling.

The availability of fiber-free rubber is focusing increased attention on mechanical and thermal methods of reclaiming. During the war a patented process depending on heat developed by milling with heavy rolls to replasticize scrap was reported *(4)* from Britain. The Lancaster-Banbury reclaiming process *(5)* has attracted considerable attention in this country. The well established continuous DIP process *(6)* features reduced labor and power along with ease of control.

These mechanical methods offer simplicity, economy and relatively high capacity considering the value of the equipment involved. Like the pan process, however, their merits can never be fully realized in the absence of an unrestricted supply of cellulose-free scrap.

Figure 2 summarizes the unit operations developed over a 20-year period which now make fiber-free tire stock available. The equipment actually selected varies somewhat with existing facilities and end-product specifications. Such an assembly may be an adjunct to an existing caustic reclaim system or a source of ground rubber sufficiently free from cellulose to be devulcanized by any known (or newly developed) method. In either instance the tire fiber is isolated as a by-product.

Debeaded cracker roll stock may be released through screen openings ranging up to 2-inch x ¾-inch in the interest of maintaining maximum reclaimed fiber length. Practically, the screen openings seldom exceed ¾-inch x ¾-inch since coarser stock flows poorly from storage bins. With such coarse screens, cracker capacities generally exceed throughput requirements by a sizable margin, making the inclusion of sizable storage bins virtually mandatory. Figure 3 illustrates a suitable stock cracked through 1-inch x 1-inch screen openings.

A uniform adjustable feed rate from storage is essential to maximum output and efficiency throughout the entire system. Cracked stock enters the tread stripping mill at a plate setting selected to separate tread from carcass with a minimum of further reduction. In this operation most of the tread is reduced to particles finer than 2 mesh. The carcass is transformed in part to individual cords, releasing some carcass rubber.

The whole tire stock passes next over a series of units designed for isolation of the carcass fraction (Figure 4). Tread rubber, along with a certain amount of rubber finer than 6 mesh, is released for further cellulose removal (Figure 5). A portion of this stock, too coarse for ultimate purification, is returned to the primary mill.

FIG. 3—Cracker roll stock.

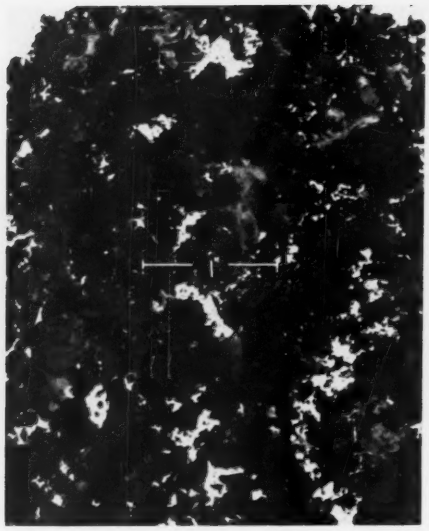


FIG. 5—Rubber separated from carcass.

Figure 6 illustrates such a recycle fraction, all coarser than 3 mesh and already reduced to less than 3% cellulose by weight.

The carcass fraction is subjected to a more intensive shredding in a suitably specified double runner attrition mill. In a system arranged as shown in Figure 2, the capacity requirement of the second mill may be as much as half the input rating of the system, depending on the recycling load. The intensive action of the second mill not only completes the stripping of rubber but actually unravels most of the thread composing the carcass reinforcement. This is accompanied by further size-reduction of the rubber as well. Figure 7 illustrates the mill product with rubber mechanically entangled.

Most of the entrapped rubber is released from the fiber in a series of beating and screening operations. The coarse perforations of the primary beater result in some loss of shorter fibers as well as rubber. This is largely corrected by a reciprocating screen through which most of the released rubber passes while the fiber balls and rolls to the end, whence it is conveyed to the secondary beater. In this special high speed unit the rubber content is further reduced by more intensive action.

The reclaimed fiber (Figure 8) will vary somewhat in character, depending upon the extent and intensity of beater action and the nature of the fiber itself. It may

FIG. 4—Isolated carcass fraction.

FIG. 6—Recycle tread, 97% rubber.

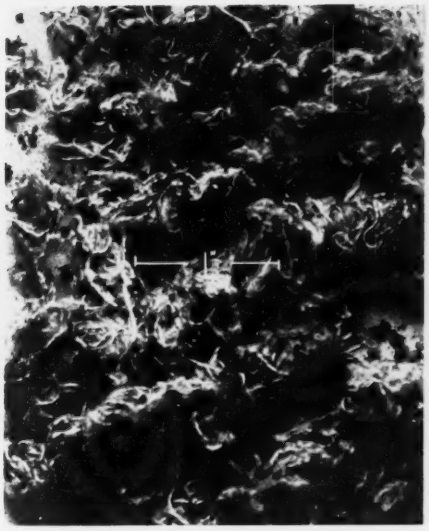


FIG. 7—Carcass after final shredding.

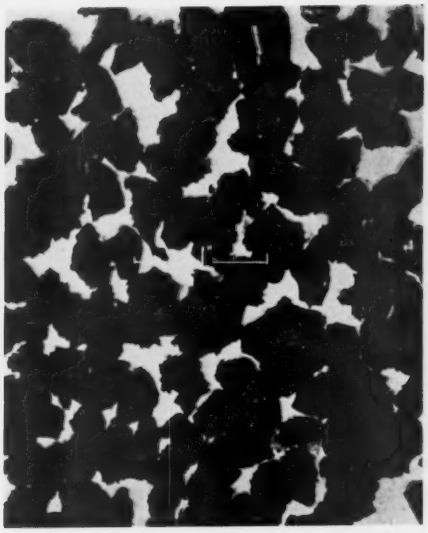


FIG. 9—Rubber (3/5 mesh) mostly tread.

be a very fluffy mass containing virtually no unraveled threads. The amount of lint will be greater for rayon than for cotton. The rubber content (RHC) can be held close to 10%, but is usually higher where a maximum output of cellulose-free rubber is of primary importance. Efficient means for further reducing the rubber content of finished fiber are still under laboratory consideration.

The rubber released by the beater along with that from the carcass isolation units passes to a set of classifying screens for the close sizing necessary to facilitate further cellulose separation. The fraction on each screen passes over an air flotation table for final removal of any remaining fiber, lint, or short sections of unraveled cord. With whole tires, the product fraction from each table may be held to 0.1 to 0.5% cellulose. An intermediate fraction, approximately 95% rubber, is recycled to the classifying screens. The rejects are returned to the carcass isolation units, thence to the secondary mill. Any lint present is removed pneumatically from the tables. Depending on adjustment, this is accompanied by a certain amount of fine rubber, mostly under 50 mesh. With proper operation, total loss represented by the lint fraction should not exceed 1 to 2%. Combining this with the fiber product is more likely to increase fine rubber contamination than increase the fiber yield appreciably.

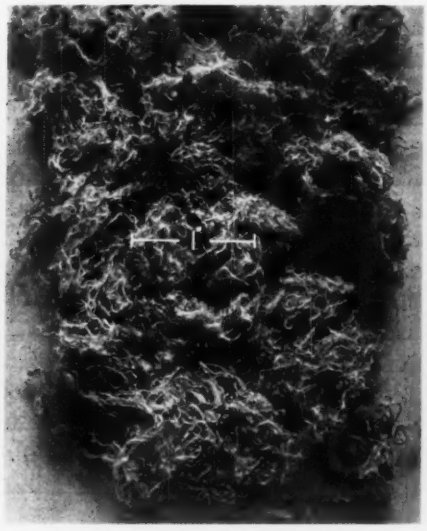


FIG. 8—Reclaimed tire fiber.

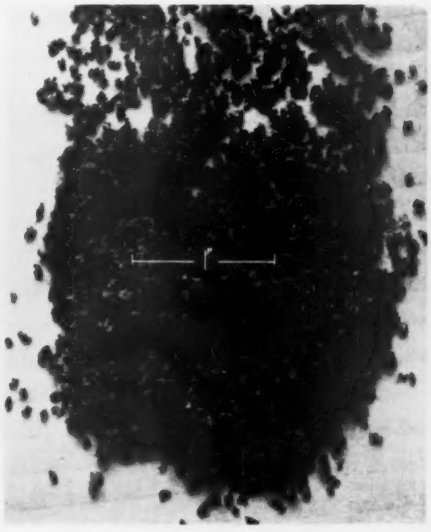


FIG. 10—Rubber (8/12 mesh) mostly carcass.

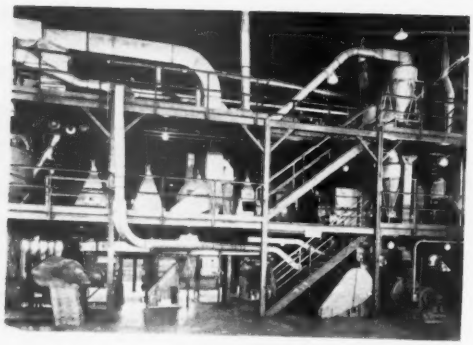


FIG. 11—General view of installation.

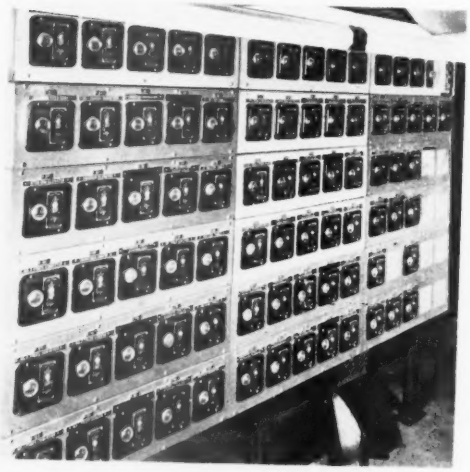


FIG. 12—Control panel for fiber system.

FIG. 13—Cracker rolls to reduce tires.

It has been found that the air flotation tables can be used with great effectiveness with 3/12 mesh stock. This is classified for use with three or four tables, depending on the capacity of the system. If the entire operation is kept on the coarse side, starting with ¾-inch x ¾-inch cracker roll screens, the fraction finer than 12 mesh will be small and sufficiently fiber-free to be added directly to the combined stream from the tables without raising the cellulose content of the finished stock much above 1%.

Considering the differences in operating conditions for the mills described above, it is apparent that the product fraction coarser than 8 mesh will be largely tread stock, while the finer fraction will be predominantly friction stock with a minor percentage of fine ground tread. Figures 9 and 10 are representative of these two categories. Under careful operating adjustments with whole tire stock, the fraction finer than 12 mesh may be held to 2 to 3% cellulose. For some uses, such as friction tape, a higher percentage of cellulose may be permissible. Where this fine fraction is so isolated, the main combined product from the tables is correspondingly lower in cellulose content.

Both reduction stages employ double runner mills compactly assembled with shaft-mounted motors and so specified as to give the required stripping and shredding—essentially tearing, rather than attrition under compression. This conserves power. The stocks issuing from the mills are seldom over 145° F., although the mill shell may reach 180 to 190° F. While the plate settings require no precise adjustments, the units must be sufficiently rugged in construction to mount a maximum of 250 HP to meet capacity demands.

The carcass isolation units, employing a series of distributing, stratifying, screening and aspirating actions in two stages, were developed in the Sprout-Waldron laboratories for this specific application. The design includes a twin reciprocating arrangement which imparts no vibration to the framework, variable speed control, and individual adjustments for every major function to insure optimum operating efficiency under all conditions.

The beaters are reels modified for this service. The stock entering one end of the perforated cylinder is rotated and conveyed by arms radiating from a central shaft. Entangled rubber particles are combed and thrown outward centrifugally to the enclosing cylinder where they pass through the perforations. The active element of the primary beater is relatively long and narrow. Here most of the rubber is removed. The

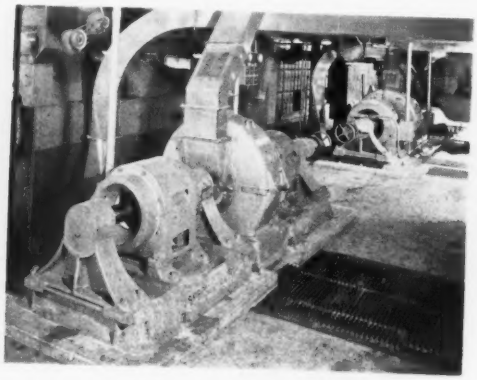


FIG. 14—Mills of fiber recovery system.

TABLE IV—AVERAGE VALUES FOR TYPICAL SPROUT-WALDRON TIRE INSTALLATION

Input rating (min.)	5000 lbs./hour
Connected HP	500-600
Average operating HP	400-500
Suggested:	
Area allowance	2300-2700 sq. ft.
Headroom (max.)	40-45 ft.
Operators per shift	2-3

secondary unit serves to further decrease the residual rubber still in the fiber. While similar in operating principle, its dimensions are quite different, and it includes provisions for removing the finished fiber pneumatically through an outlet slot along the entire length of the cylinder, as well as an end discharge. Variable speed drives are specified for both units.

On each air flotation table partially suspended stock moves across the slightly tilted and perforated top under mechanical agitation. Considerable stratification results from this combined action, reflecting differences in particle densities (and to a lesser extent, sizes and shapes) of the screened fraction. Visually distinct areas are set up from which the fiber-free product, middlings and recycle are isolated by adjustment baffles. These units are made by Sutton, Steele & Steele, Inc., of Dallas, Texas.

Figures 11 to 18 provide an over-all impression of a typical installation, while illustrating all of the basic units as well. Design details of the mills, beaters, and air flotation tables specified for this application are covered in several patents *(7)*.

Data relating primarily to debeaded whole tire stock are summarized in Table IV. These average values reflect individual preferences with respect to arrangement, conveying details, safety and maintenance, space requirements, motor specification policies, allowances for stock storage, and the like. Actual operating power varies somewhat with stock type and conveying facilities. For a specific stock, the greatest operating variable affecting power is the moisture content of the carcass stock entering the second mill. One survey covering all operations from debeading to finished reclaim assigned less than 10% of the electrical power load to the S-W installation.

On whole tire rubber production a bulk density of 27

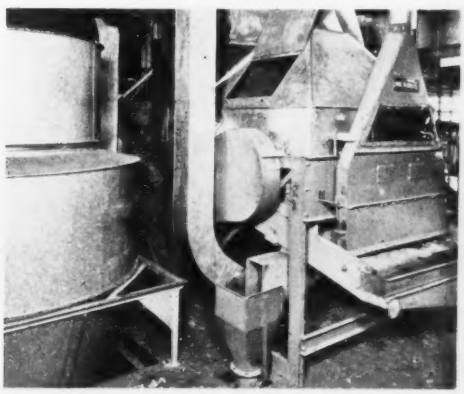


FIG. 15—Carcass isolation unit.

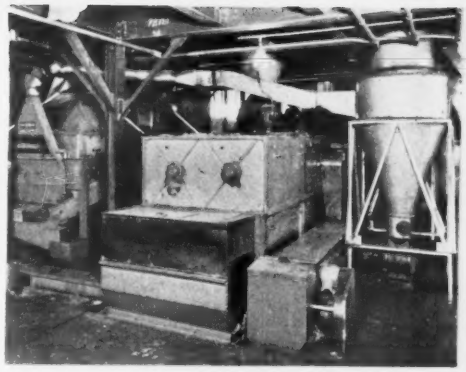


FIG. 16—Primary beater.

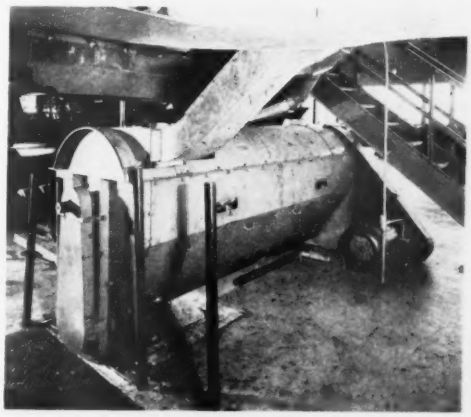


FIG. 17—High speed secondary beater.

FIG. 18—Sutton, Steele & Steele tables.

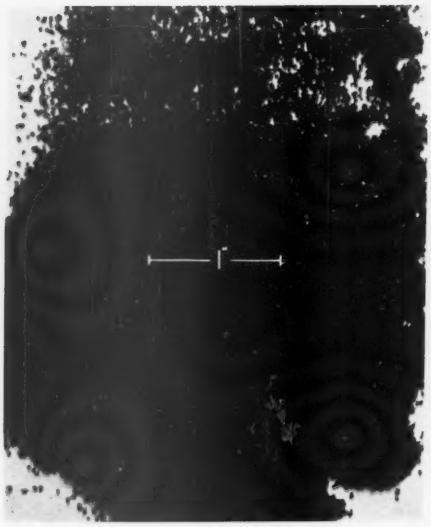


FIG. 19—Tread fraction cut through 20 mesh

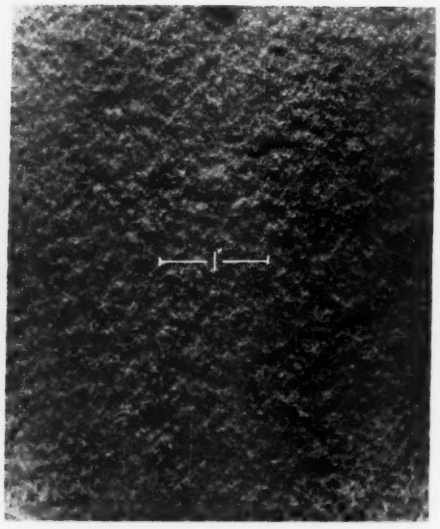


FIG. 20—Tire fiber flock passing 30 mesh.

lbs./cu.ft. has been measured. Size distribution for sampled lot 7786 was:

Mesh	3	4	6	8	10	—10
Wt.—%	9	19	30	13	10	19

The product is readily collected as two fractions, predominantly tread and friction rubber, respectively. Laboratory tests indicate that the tread can be further reduced to pass 20 mesh (Figure 19).

The fiber by-product can be maintained sufficiently free from rubber to have substantial commercial merit. Limited sales are already reported among three established producers. Potential markets include reinforcement for battery cases and roofing paper, upholstery stuffing and friction tape. This fiber can be considered as a reinforcing filler in any molded composition where the presence of rubber is not incompatible. It can also be converted to flock specifications (i.e., mm. lengths, Figure 20) applicable to formulas such as sole and heel stock.

The method is suitable for all types of tires, natural or synthetic, and to certain other fiber-bearing materials (No. 3 peel, carcass, etc.) as well. Even with wet or frozen stocks, dry rubber results. There is also an appreciable lowering of moisture in the fiber incidental to pneumatic conveying and milling.

In many ways such an installation may be as attractive to scrap dealers as reclaimers. Isolating the fiber as a salable by-product automatically up-grades the rubber. In addition, the fractions predominantly tread or carcass can be promoted as specialty products. Finally, the classifying screens automatically provide several intermediate size fractions for special markets [brake lining granules, fine rubber dust for road surfacing formula *(8)*, etc.].

For shipment or storage, the finished rubber is much lower in bulk. It is ideally suited to almost any mode of mechanical conveying or feed rate control. With properly designed storage bins, it is free from the nuisances of settling or bridging.

For reclaimers the value of such an installation will vary considerably from one plant to another. This rules out any attempt to set up generally applicable economic tabulations. Factors to which individual plant figures can be assigned are more readily set forth. One of the summaries which follow relates to digestion methods specifically because of the present-day importance of this method.

ADVANTAGES APPLYING TO ALL RECLAIMING PROCEDURES

1. The rubber can be reclaimed by any type of chemical, thermal or mechanical method.
2. Chemical and thermal costs for decomposing the fiber are eliminated.
3. The gravimetric capacity (and therefore the output rating) of any devulcanizing unit is substantially increased.
4. Variations of any devulcanizing procedure can be applied to the tread and friction fractions separately where advantageous.
5. It is practical to maintain residual cellulose approaching zero in the finished reclaim.
6. The use of coarser screens automatically increases the capacity of the cracker roll system while decreasing its power requirement.
7. The power required by the fiber removal system is largely offset by power conserved at the cracker rolls and fine grinding rolls.
8. Salable reclaimed fiber can underwrite a substantial portion of any additional power cost. As markets for this fiber develop and quality improves, it may well offset the power and labor costs for the entire fiber recovery system.
9. Modified versions of the fiber recovery system can be adapted to any existing or proposed reclaiming procedure.

ADVANTAGES RELATING TO DIGESTION PROCEDURES

1. Digester capacity is substantially increased.
2. Advantage can be taken of the treatment modifications best adapted to tread and friction rubber individually, giving a combined end-product of improved uniformity.

(Continued on Page 821)

The Surface Coating and Impregnation of Fabric

(Concluded from Preceding Issue)

By C. A. LITZLER

President, Industrial Ovens, Inc., Cleveland, Ohio

Saturation of Mechanical Goods Fabric

We have attempted to give you basic information on the general design and operation considerations in surface coatings of rubbers or other materials to fabrics or papers. Let us now consider the saturation of mechanical goods fabric as a distinct manufacturing operation.

A preliminary saturation of the fabric with rubber bonding or conditioning material is required in the manufacture of pneumatic tires and also transmission and conveying belts and a host of other end products manufactured by the rubber industry. In addition to applying this adhesive or bonding coat to the web, there is the secondary requirement of hot stretching or attenuating many of the fabrics that are in use today. This is true of the synthetic fabrics such as rayon, nylon, dacron and orlon.

By the application of proper drying heat and tension, the stress-strain characteristics of the final fabric are greatly increased and made more adequate for the end uses they are to serve.

All types of fabric construction and weaves are encountered in the saturating of mechanical goods—square woven fabrics, ducks, cord fabrics and weftless fabrics in all combinations of synthetic material; in fact, the entire field of all types of industrial fabrics must be saturated, impregnated or treated in some manner or other.

The saturation of ply stock for pneumatic tires, transmission belts or other mechanical goods is the application of water- or solvent-carried solids to the web in final dried deposition varying from 4 to 15% of the fabric weight. The usual adhesive materials are water- or solvent-dispersed latex, reclaimed GR-S rubber, Hycar or neoprene rubber, or isocyanate-based adhesives. The impregnation material is usually applied to the fabric in solution form with solids in that solution ranging from 40% down to approximately 5%. The viscosity of the solution ranges from approximately 6000 centipoises down to 1000 or lower.

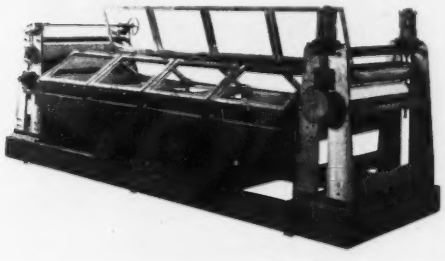


FIG. 41—Saturating tank for long time immersion

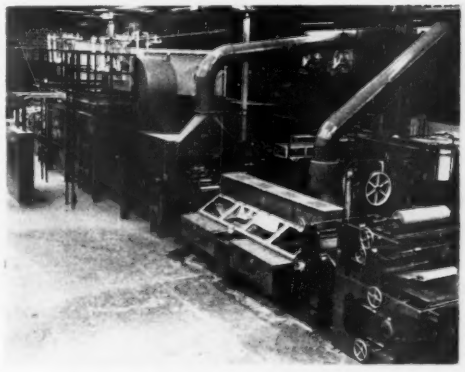


FIG. 42—A complete triple high saturating system

The impregnation is actually accomplished by continuously immersing the material in the solution for a given period of time. After immersion, the excess solution is removed from the fabric by means of squeeze or padding rolls or by other mechanical means. Then the impregnated fabric moves into the saturator dryer wherein the water or solvent is evaporated from the fabric. The solids remain on the fabric as the coating or adhesive coating.

In order to put a logical arrangement of description of parts of the operation, we shall next discuss several types of saturating units.

Types of Saturating Units

There are two basic types of saturation requirements. One requires relatively long time immersion in the saturant and the other short time immersion. For the saturation of both papers and certain composition webs, long impregnation times are required. For most fabrics, relatively short immersion times are required. Both types require padding or squeeze rolls for moisture removal or thickness control. Paper saturating systems are usu-

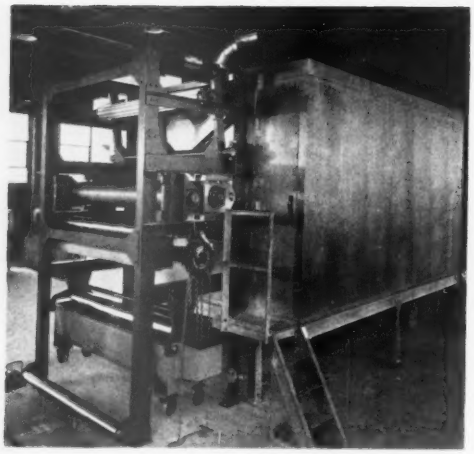


FIG. 43—Simple padder and wringer roll assembly for slow speeds, short immersion times and medium back tensions.

ally equipped with impregnation tanks that are very similar to the one shown in Fig. 41.

This tank is approximately 18 feet long and so arranged that the multiple webs traveling through are immersed for practically the entire 18 foot of length. The immersion time is about 40 seconds. The webs pass from the unwind stands through the tank feed rolls to the solution and thence out through squeeze rolls at the far end of the tank. After saturating, the final squeeze rolls accurately size the thickness of the single or multiple webs and control the amount of saturant remaining in the web. From the squeeze roll, the material passes into the dryer. This type of saturation tank is normally used for low operating tensions but long impregnating times. A complete saturator installation of this type is illustrated in Fig. 42.

For impregnations of fabric requiring only short immersion times a vertically disposed size tank and squeeze roll stand is employed. The fabric comes in at the left hand side of the main frame over a guide roll, thence under an immersion roll within the immersion tank, thence vertically upward through to the padder roll stand, and thence vertically upward to an upper guide roll from which the fabric passes directly into the evaporator and dryer. Such a saturator and padder is shown in Fig. 43.

The saturation of heavy synthetic webs which require high tension during their drying require heavy-duty saturating tank and padding roll assembly. One of the types of dipping machines used in this operation is shown in Fig. 44.

The actual dipping is accomplished in the dipping tank which, in operation, is in the raised position. After saturating in the dip tank, the material is passed through double-edged, machined scraper blades, and from there it passes through a triple high squeeze roll stand with approximately 55,000 lbs. squeeze pressure applied to the fabric. This pressure removes the excess material. The center roll of this stand is fixed and driven and the upper and lower rolls idle and are hydraulically operated to provide the wringing pressure and hold-back tension.

Dip tanks of this type are suitable for operations at very heavy back tensions and for speeds up to 70 or 80 yards per minute. The immersion time, here, at 70 YPM is approximately three-quarters of a second.

Evaporating and Drying Units

After saturating and padding, the fabric passes immediately into an evaporator or dryer unit. The general relationship of padder roll stand to padder dryer inlet zone of a horizontal dryer is illustrated in Fig. 45. It shows a 24-inch wide material saturator and dryer assembly.

The three elemental designs of saturators and padder assemblies are simple and rugged in their design and construction and are suitable for saturation of a wide range of single or multiple webs. They are used on all types and styles of fabric at various slow to high speeds and from zero tension to 12,000 lbs. total tension in the fabric.

After saturation and excess material removal, the material enters the dryer wherein the remaining water or solvent vehicle is dried to an end condition of zero moisture or slightly higher. There are wide variations allowable in the design of the drying units and these differences are principally in the handling methods employed to carry the fabric at its operating tension and speed through its drying time in the dryer unit.

The more important types of handling systems in saturation dryers are as follows:

(1) Tunnel Type Dryer—with relatively short drying times.

(2) Fixed Festoon Dryer—with longer drying times.

(3) Drum Dryer—with relatively short drying times.

(4) Drum plus Festoon Dryer—with relatively long times.

Maximum operating air temperature is an important design consideration in a saturation dryer. As all drying operations are a combination of drying times and temperatures, the maximum limit of each of these conditions must be determined. These two factors must be analyzed with respect to the temperature of the fabric itself and the time that is required to develop that temperature under the conditions existing within the dryer.

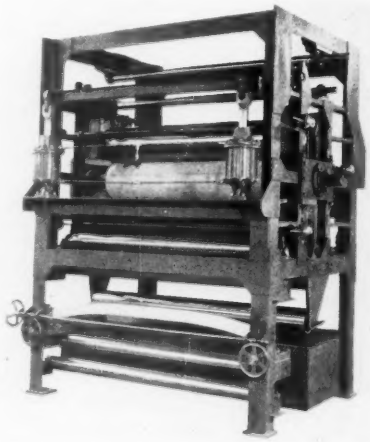


FIG. 44—Tip tank and three high squeeze roll stand for short immersion times and heavy back tensions.

Maximum drying temperature is important and, in all cases, is that temperature which, in itself, would be deleterious to the fabric or dangerous because of the solvent flashpoint. Most requirements for solvent evaporation dictate the use of single evaporating zones and sometimes double zone evaporating units, depending upon the evaporation rate that is required or on the amount of solvent which is to be removed from the fabric at the necessary production speeds.

Normally in the multi-zone solvent evaporator units the first zone operates at the approximate temperature of 180° F. while the second zone will range up to 300° F. or within the end boiling range of the solvent being employed. It is necessary, usually, to limit these temperatures to a maximum range of 325° F. for rayon materials and 250° F. for cotton goods. Slightly higher temperatures are allowed for other synthetic fabrics, such as nylon, orlon or dacron.

The top temperatures in the fabric are directly proportionate to the drying air temperature and velocity, the time within the evaporating unit, and the thermal conductivity of the material. Seldom should either the time or the air temperature exceed a total value that will produce heat in the fabric in excess of approximately 325° F. Special exceptions are the newer synthetic fibers.

Operating tensions for proper strain-stretch development are important and vary over a relatively wide range. Most cottons are run at a tension of approximately ½ lb. to 1½ lbs. per inch of width up to approximately 5 to 7 lbs. per inch of width for the heavier ducks and cord fabrics such as tire ply, breaker fabric or liner stock.

Rayon materials for use other than cord fabrics are run at low tensions depending upon the stress strain characteristic desired in the web after treatment. In rayon cord fabric stock, the tensions run in the order of one to 1½ lbs. per cord which, in a normal width mechanical fabric, is in the order of 3000 lbs. total tension across a 60 inch fabric width.

The percent of stretch required in the final fabric will determine the actual operating tensions in the saturation dryer. Materials such as nylon, orlon and dacron have been processed at tensions as high as 10 lbs. per cord. Much investigation is being done by industry to determine the proper heating time, temperature and tension relationships for the full treatment of these particular cords to develop their full load strength.

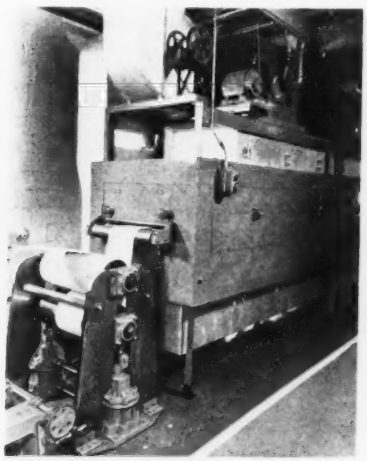


FIG. 45—This illustration shows the relationship of the padder rolls to the saturator drive.

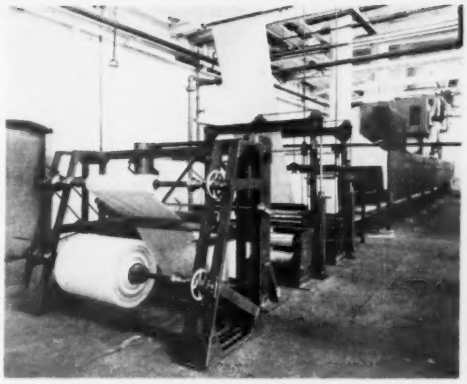


FIG. 46—View of a complete saturation line for mechanical belt stock.

In the manufacture of surface-coated fabrics, the final condition of the coated surface is of extreme importance and, accordingly, the coated fabric must not be passed coated face down over rolls or work supports. In the saturating equipment, this is not a strict design requirement and the designer is allowed more latitude in the design of the web handling elements. Because this particular liberty can be allowed in the design, a somewhat different design of dryer is used for solution impregnation dry-off, whether that solution be water or solvent.

Impregnation Solution Dry-Off Ovens

The several basic types of impregnation solution dry-off ovens are described below:

Fig. 46 indicates the general conception of a tunnel type evaporating unit as it is used with a vertical mechanical goods saturator. It is a straight-through single pass tunnel dryer equipped with pressure squeeze rolls at the entering end and with high tension pull-out rolls at the back end. Top and bottom high velocity convection drying is utilized. The drying rate is very rapid due to the high velocity convection heating method and dual side exposure of the fabric to the heating media. Relatively high speed evaporation is accomplished in this type of system. This system is used when the padded goods cannot be carried on a work-supporting conveyor.

An equally simple type of evaporator for after saturating drying is shown in Fig. 47. It consists essentially of a series of double festoons of the fixed roll type, all contained within the dryer enclosure. The fabric passes over and under the festoon roll as is indicated. During this passage, the fabric is subjected to high velocity heated air. This simple system is usually employed when the saturated fabric is not harmed by passing around support rolls or where there is no danger of pick-up of the impregnating material by the roll face.

The excess saturating material is removed and the hold-back drying tension is developed in the squeeze rolls at the front end of the system. The propulsion and

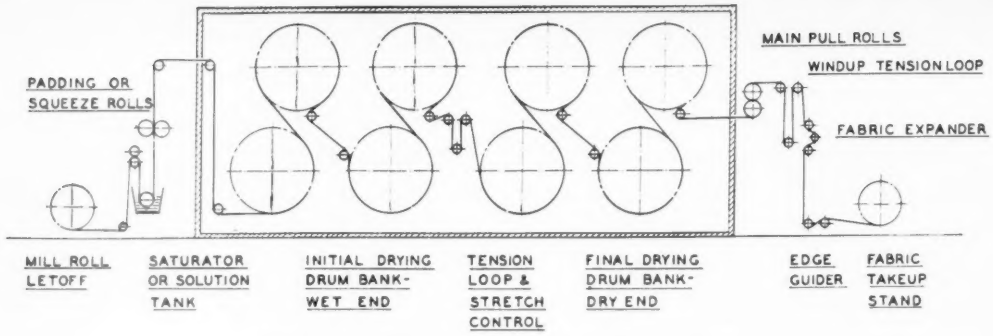


FIG. 47—Drum-type saturator for mechanical goods.

stretch of the fabric is metered by the main pull rolls at the dry end of the system. Suitable tension applicators are provided within the dryer so that adequate control of fabric stretch might be accomplished. With handling systems equipped with proper range drives, the operation can be conducted at constant tension or constant stretch, whichever is required. This design is simple, effective and will serve in many cases of simple saturation at slow speeds.

Fig. 48 indicates equipment utilizing combination coating and saturating in addition to high pressure padding rolls for excess solids removal and fabric hold-back for both stretch and tension control. Surface coatings of several types as well as impregnation are handled in a system of this type.

Drum-Type Saturator Dryers

Operations requiring higher process speeds than can be obtained with a simple festoon dryer can be performed in drum-type saturator dryers. These dryers are, as their name implies, equipped with large diameter, open-type convection heated work drums around which the fabric passes, as illustrated in Fig. 49. The drums are in the order of 6 to 12 feet in diameter and are arranged in staggered rows to obtain maximum fabric wrap.

Because the stretch rate of the fabric as dried is variable in proportion to the moisture content and the tension of the fabric, it is often necessary to sub-divide the drums into several driven groups for proper variable speed and tension control. This drive arrangement allows for operation of groups of four drums from the same variable speed drive. The first four-drum group may operate at different speeds than the next group of four drums. Where accurate tension or stretch control is required, constant tension control is normally obtained by means of loaded dancer tension and speed control operating between the two drum stacks.

Where a large amount of fabric stretch is required, each individual drum is equipped with a special electronically-controlled motor drive unit to allow completely independent speed on each particular drum. The speed of each of the drums is entirely dependent on the stretch rate of the fabric moving around each drum. In the installation shown, the squeeze and padding rolls and the main pull rolls provide the propulsion speed range for the fabric. Fabric stretch is controlled by loaded dancer control midway between these basic drive rolls.

The motor driving the front end drum stack also drives the front squeeze rolls. The back end drum stacks are driven by the back end pull-out roll motor drive. The dancer loop in between the two is used to operate a variable voltage rheostat or a saturable core reactor synchronously controlling the speed of the front and rear drum stacks.

Fig. 50 shows an actual installation utilizing five drying drums or reels. Note the relative placement of the drums in relation to each other.

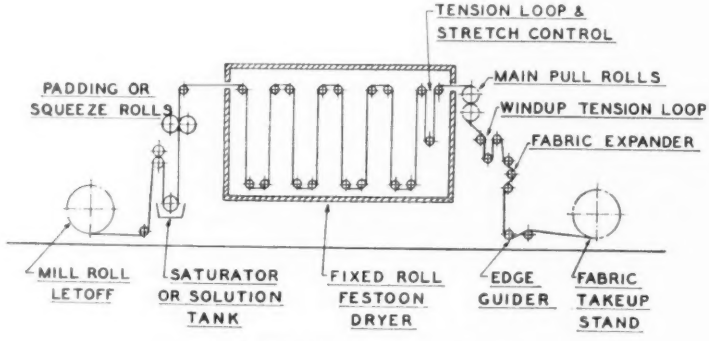


FIG. 48—Simple festoon saturator.

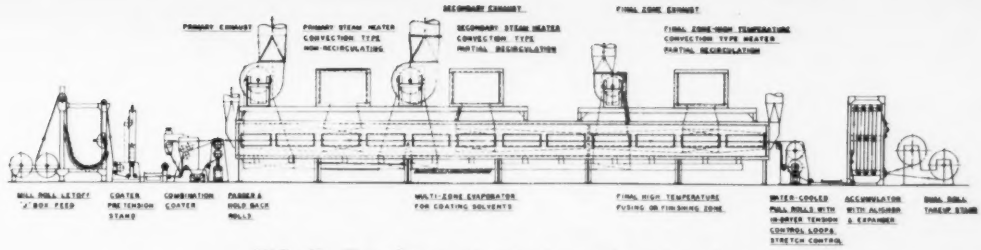

SECONDARY EXHAUST
FINAL ZONE EXHAUST
PRIMARY EXHAUST
PRIMARY STEAM HEATER CONVECTION TYPE NON-RECIRCULATING
SECONDARY STEAM HEATER CONVECTION TYPE PARTIAL RECIRCULATION
FINAL ZONE HIGH TEMPERATURE CONVECTION TYPE HEATER PARTIAL RECIRCULATION
MULTI-ZONE EVAPORATOR FOR COATING SOLVENTS
FINAL HIGH TEMPERATURE FUSING OR FINISHING ZONE
WATER COOLED PULL ROLLS WITH IN-DRYER TENSION CONTROL LOOPS STRETCH CONTROL
ACCUMULATOR WITH ALIGNER & EXPANDER
DUAL ROLL TAKE-UP STAND

FIG. 49—Tunnel-type saturator for mechanical goods.

In some cases, it is desirable to provide saturator dryers which are combinations of several designs. Fig. 51 indicates a combination of a wet-end drum dryer and a dry-end festoon dryer. This type of installation is commonly used in the continuous latexing of tire cord. The principal advantages of using a combination of drum dryer and festoon dryers are gentle fabric handling, draw-down control of the fabric, ease of tension control, and saving in floor space.

The drums used at the wet end dryer section are normally equipped with work-supporting bars displaced radially on close centers around the diameter of the drums. These drums are synchronously driven and operate at the exact same speed as the fabric. Because of point contact at the work supports, there is very little opportunity for bar marks to develop on the fabric. Likewise, the impregnation materials do not pick-off the fabric and deposit on the drum work flights.

It is possible to use straight festoon type dryers at the final end of the drying range on many types of fabrics. Festoon dryers are used at the final dry-out end of the drying operation because of their space and construction economy. Festoon dryers can be used only when the fabric is sufficiently dry so that the impregnant or adhesive will not pick off the fabric and deposit on the festoon rolls. The tension control is applied between the two dryer zones so that accurate speed synchronization can be effected.

Continuous Train Operations

The present trend to increase speed and simultaneously reduce cost in processing operations has resulted in the installation of continuous saturators operating in direct train operation with rubber calenders. This continuous operation has been applied to cord fabrics for a considerable number of years and very many installations are now operating at high speeds. Many more are in the process of construction.

Fig. 52 shows the schematic arrangement of the equipment involved. The general relationship of the impregnating line to the calender and to the calender take-off equipment is pictured. This equipment arrangement provides for complete saturation in train with calendering as an integrated continuous operation. Suitable drive and operating arrangements allow complete calender train operation or simultaneous calender or latex impregnations as a separate operation. Convenience and flexibility of systems of this type provide economical fabric handling.

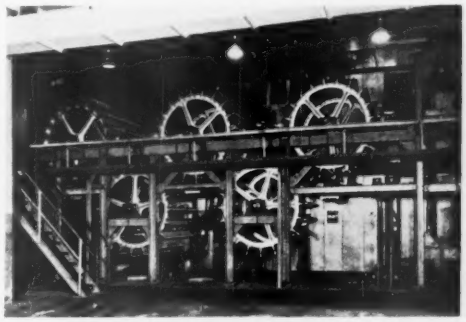


FIG. 50—Erection view of a drum dryer.

In the case of mechanical belt stock, there are several latexing units now positioned for operation continuously in train with the calender. Because of the very wide range of coatings and impregnations and tensions in-

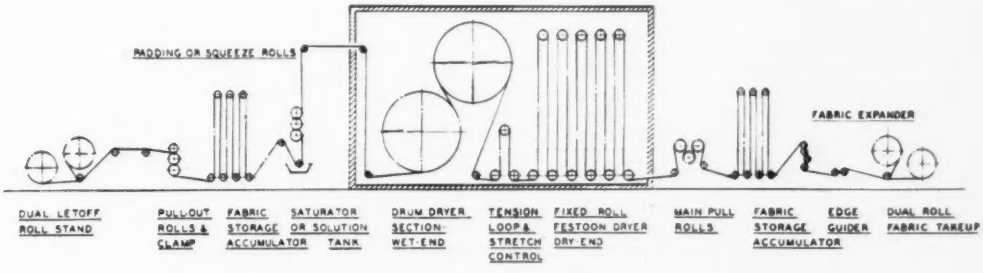


FIG. 51—Combination drum and festoon dryer for mechanical goods.

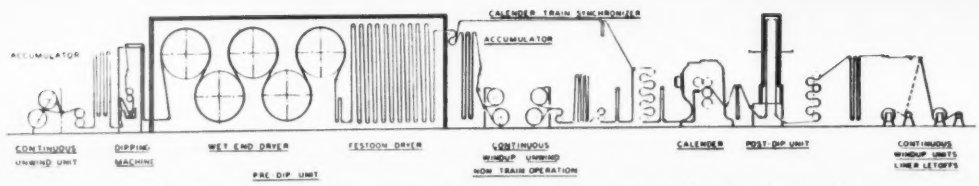


FIG. 52—Schematic arrangement of a continuous processing line for tire cord.

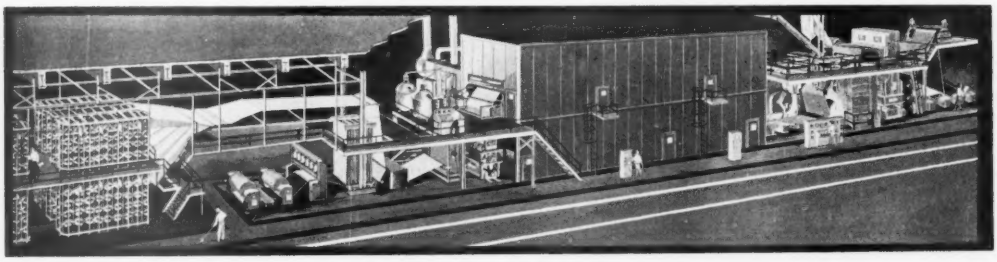


FIG. 53—Artist's view of a creel to calender continuous processing line.

volved in this particular installation, the equipment is somewhat more involved than the usual saturator. When running in train with a rubber calender, the wind-up is by-passed and the cord passes directly into the calendered bite under constant tension and moisture conditions. Operating speeds of this continuous system are, naturally, in the medium speed range.

The suitability of train operation must be carefully balanced against the number of changeovers required by different fabric styles, rubber compounds and production rates to be effected. Very few mechanical goods operations can justify calender train tie-in, but those that can do so result in sharp reductions in operating costs.

Fig. 53 pictures an artist's drawing made from actual photographs of one of several large lines that has been in operation for several years on complete, continuous train to calender operation on tire fabric. This particular photograph also indicates an excellent example of continuous operation at its economic best.

This unit operates either from a creel cord supply or from woven fabric mill roll supply. When running from the fabric creel there is no weaving of the fabric required. The individual cords are progressively grouped together in the creel and then they are handled as a sheet of cords, all in the same plane. Proper cord tension in each individual cord assures uniform stretch and processing in each cord despite the fact that as many as 2,000 parallel cords are handled simultaneously.

The weftless cord fabric is formed, impregnated, dried and stretched, calendered and cemented and then wound up as a continuous rubberized sheet fabric. Initially, the fabric starts out directly from the cones in the creel as an individual untreated cord, and finally, at the completion of the continuous process, is wound up as a complete rubberized fabric. Operating speeds are well in excess of 60 yards per minute.

With the advent of the new synthetic fibers in woven and weftless forms for reinforcements in mechanical goods fabric, the attenuation or hot stretch of that fabric to a proper strain-stretch characteristic is of utmost importance. This fact has already been discovered in the processing of nylon and certain rayon reinforcing fabrics. Work is now being done on the orientation of nylon fabrics in the tension ranges of 10,000 lbs. and at temperatures in the order of 400° F.

A large amount of laboratory work is being done at the present time to determine the effects of time, temperature, tension and twist in the individual yarn so these factors may be properly organized under complete process control conditions. This work is rapidly being translated into actual installations which are adequately designed and built to provide the optimum condition for the processing of these materials. It is only in that manner that the greatest proper end use of these new fibers can be obtained.

Much more interesting and important laboratory and development work lies ahead for the manufacturer and large scale user of synthetic fabrics and for the machinery builder who will translate this data to actual equipment designs and installations. Cooperative effort in this important task will indeed develop the maximum benefit to all concerned.

Foxboro Ball Valve

A new ¼ inch ball valve of unique construction, recommended for working pressures up to 3,000 psi, has been announced by the Foxboro Co., Foxboro, Mass. Tight, positive shutoff is provided by a stainless steel ball which closes into a machined, conical seat. The ball, retained at the end of the stem, is free-rolling so that every closing brings a new surface into contact with the valve seat. Alignment of ball to seat is accurately piloted by a forged steel, union-type bonnet, fitting tightly to the body and assuring a correct valve closure.

The long-stroke stem and the packing gland are made of stainless steel for durability and resistance to corrosion. The packing is a preformed, graphited asbestos with a plastic binder and can easily be replaced without shutting off the line pressure or interrupting the process. Straight-through and angle types are available with two and four connections, meeting the wide range of valve-design requirements found in general industrial use, as well as in pilot plants and laboratories.

Editorials . . . . . .

Plant Disposals

UNDER the terms of the current Rubber Act, which expires on March 31, 1954, a disposal plan for the $750,000,000 synthetic rubber facilities must be submitted to the President by the Reconstruction Finance Corporation by March 1st of next year. This plan must, in turn, be submitted by the President in the form of legislative recommendations to Congress by April 15, or approximately six weeks later. Shortly after the latest law was enacted, RFC established several working committees, composed of industry members, to help draft ground rules to govern the sale of the plants to private industry. The work of these committees is coordinated by Morton E. Yohalem, an RFC Deputy Administrator.

That Mr. Yohalem swung into early action is indicated by reports from Washington to the effect that an early attempt will be made to secure an engineering appraisal of the value of the twenty-six plants which still remain in the government's synthetic rubber program. Of these plants fifteen are polymer units, including two Butyl rubber units, and the balance are feedstock units. An independent appraisal of the value of each of these plants is a "must" before proper negotiations can be conducted between government agencies and private industry, since there is considerable divergence of opinion with respect to such values. It is understood that several prominent engineering firms have already submitted bids to RFC for the survey.

Some opposition to the sale of any of the synthetic rubber facilities to private industry has recently been raised by union leaders in the rubber field. These officials argue that on the surface the sale of these facilities to rubber manufacturing concerns is practically impossible unless the facilities are sold far below their "admitted value." This argument is based on the claim that the plants involved cost the American taxpayer approximately $750,000,000 at the time they were built (and accordingly are valued closer to $1,000,000,000 today), whereas the total liquid capital of the rubber manufacturing industry is only $600,000,000, against which there are many outstanding liabilities.

There are many defects in this argument. In the first place, the rubber manufacturers are concerned primarily with the copolymer plants only, preferring in most cases to purchase the necessary raw material feedstocks from outside sources. In the second, there is very little likelihood that the eventual transactions will be made on a cash basis. Since it is the announced intention of the government to steer the plants away from any possible monopoly set-up, and to encourage the purchase of some of the units by small groups of rubber manufacturers banded together for the purpose, as they are in the operation of some of the existing units, the probabilities are that long-range terms will be provided. Accordingly, the arithmetic involved will be much simpler than it appears to be on the basis of the figures quoted above.

Another argument advanced by the union officials has a good deal more merit, i.e., under private control how could the United States be sure of sufficient supply of synthetic rubber in the event of a national crisis, since profit alone would determine the amount of synthetic production? This is a problem which is causing many sleepless nights for those charged with the preparation of a satisfactory disposal plan. Once the units are dispersed by sale to private operators, including both the copolymer and feedstock units, it might be somewhat difficult to have all of the facilities maintained in operating or stand-by order as they now are, unless some definite strings were attached to each sale. But if such strings are attached, then the prospect of early sales will be somewhat dampened, since there would still be a semblance of government control over production facilities.

Rubber manufacturers are proceeding very cautiously with regard to purchasing any of the government's synthetic rubber facilities until clear-cut offers can be made across the board. Every one of these manufacturers is well aware of the importance of synthetic rubber to the nation's over-all welfare, in addition to the profit possibilities, and would welcome a selling agreement which would protect both the nation and their right to free enterprise. The chances that such sales arrangements will be conceived within the next several months are quite good.

Safety Progress

IN 1912, a month before the election in which Woodrow Wilson defeated Taft and Teddy Roosevelt, a small group of men met in the Hotel Pfister in Milwaukee. It was the first meeting of the Cooperative Safety Congress and the facilities of the hotel were ample for the group. The facilities of five great Chicago hotels will be strained to handle the meeting of the National Safety Congress this year, while scores of hotels will house the delegates. In the ensuing 40 years, the safety movement became one of the outstanding examples in history of voluntary, self-supporting, cooperative action effectively combatting a grave social evil. The safety engineer has found his well-merited niche in industry.

NEWS OF THE MONTH

NPA REMOVES RESTRICTIONS ON PURCHASE OF COLD GOVERNMENT-PRODUCED SYNTHETIC RUBBER

IN an amendment to Order M-2, dated August 29, the National Production Authority removed restrictions on the purchase of "cold" government-produced synthetic rubber. NPA removed all controls on the purchase of cold rubber because present Reconstruction Finance Corporation inventories, plus new facilities coming into production, will put supply and demand in approximate balance. Removal of buying restrictions on cold rubber will benefit individual manufacturers, NPA said, and will permit a greater quantity to be available to fill defense orders. NPA explained that the action was taken at the request of RFC. The action would have been requested sooner, NPA declared, but RFC has only recently assessed the damage caused by an explosion in one of the Louisiana plants. RFC now finds that the plant will shortly be back in full production and therefore felt that relaxation of controls was in order.

In an administrative move, RFC has abolished its Office of Production and has set up a new Office of Synthetic Rubber to direct the synthetic rubber activities formerly carried on by the Synthetic Rubber Division of the Office of Production. E. Dorrance Kelly, formerly director of the NPA Rubber Division, has been named director of the Office of Synthetic Rubber. Leland E. Spencer, formerly chief of the Synthetic Rubber Division of the Office of Production, has returned to private industry as assistant to the president of the Goodyear Tire & Rubber Co. He will continue to serve the government, however, as consultant to the new Office of Synthetic Rubber.

Mr. Kelly was deputy director of the Rubber Division of the War Production Board and of its successor agency, the Civilian Production Administration, from 1941 to 1946. He returned to private industry until July, 1948, when he joined the staff of the deputy administrator of the Economic Cooperation Administration. He was named director of the NPA Rubber Division in March, 1951.

Walter A. Krappe, associated with NPA since October, 1951, has been designated as acting director of the NPA Rubber Division. Mr. Krappe started in the rubber industry in 1918 with the Norwalk Tire & Rubber Co. of Norwalk, Conn. In 1950, when Mr. Krappe was vice-president in charge of manufacturing, the company was sold to Consolidated Products of Connecticut, Inc., who later resold the plant to the Armstrong Norwalk Rubber Corp. During the period when Consolidated Products operated the plant, Mr. Krappe served as general manager. He left the plant when Armstrong Norwalk purchased it. During his early days in the industry, Mr. Krappe was also associated with Goodyear, returning to Norwalk Tire in January, 1933.

Changes Sale Procedure

From time to time, RFC reports, various companies have commented upon the procedure followed in the sale and distribution of synthetic rubber manufactured by the government. It has been stated that the "Purchase Request—Purchase Permit" system is too cumbersome, too time-consuming and that it involves too much "red tape." Consequently, in an effort to simplify the procedure and make it conform as nearly as possible to that used in commercial practice, RFC has revised that procedure by an amendment to the General Sales and Distribution Circular, dated August 25.

The amendment states that effective with requests for October, 1952, prospective purchasers shall employ, instead of the "Purchase Request," whatever purchase forms he uses in the normal conduct of his business. On the face of this purchase order, the purchaser must write or stamp the following: "This Purchase Order is subject to the 'General Sales and Distribution Circular' issued by the Reconstruction Finance Corporation, as amended, including amendment dated August 25, 1952."

The purchase order will merely constitute advice of the type and quantity of synthetic rubber requested, the destination, and the requested shipping dates. Separate purchase orders must be submitted for each general category of synthetic rubber requested, i.e., GR-S, GR-S Latex, GR-I. All purchase orders must be mailed to the Reconstruction Finance Corporation, Office of Synthetic Rubber, Sales Division, 811 Vermont Avenue, N.W., Washington 25, D. C., in sufficient time to reach that office not later than the twelfth day of the month preceding the month in which shipment of the rubber is desired. All requested shipping dates on a particular purchase order must be confined to a single calendar month.

Consumers who wish to purchase synthetic rubber produced by RFC may purchase either directly from RFC or from a dealer who has purchased from RFC as a principal. In the latter case the dealer will submit his own purchase order to RFC.

"Purchase Permits" will no longer be issued. Upon receipt of the purchase order, RFC will forward a "Shipping Order" directly to the distributing agent scheduled to effect shipment of synthetic rubber requested by the prospective purchaser. A copy of this shipping order will be forwarded to the prospective purchaser. This will constitute a courtesy acknowledgement of the purchase order and will indicate to the prospective purchaser the source from which the synthetic rubber is scheduled to be shipped.

Separate shipping orders will be issued for each type of rubber and the quantity and provisional price as well as the destination and desired shipping dates will be indicated. Shipping orders of those accounts which have established credit will be perforated to indicate that the material may be shipped on a 30-day credit basis.

When the prospective purchaser receives a copy of the shipping order, he should immediately forward to the distributing agent named in the shipping order, detailed routing instructions, together with cash-equivalent funds covering the provisional price if he has not established credit.

When the distributing agent receives a shipping order, routing instructions and funds (when credit has not been established), he will endeavor to ship the quantity and type of synthetic rubber listed on the dates scheduled.

No Obligation or Liability

It should be understood that neither RFC through the distributing agent, nor the agent himself, shall have any obligation or liability for failure to ever ship or deliver all or any portion of the synthetic rubber listed in the purchase or shipping order. In the event that shipment is made on or after the shipping date set forth in the shipping order when the distributing agent has not received routing instructions, the agent will ship the synthetic rubber by the most economical route.

However, neither RFC nor the agent

will be liable for any loss, damage or delay which may result from the selection of a particular route or mode of transportation. In the absence of written notice from the prospective purchaser to cancel an undelivered quantity listed in a purchase or shipping order, RFC has the right, without obligation, to make deliveries at any time.

Upon delivery of the shipment by RFC through the distributing agent to the custody of the carrier the sale is consummated. The purchaser must pay the price as set forth in the shipping order plus the uniform freight charge.

In the event that RFC increases or decreases the purchase price set forth in a particular shipping order, the prospective purchaser will be notified. No deliveries will be made thereafter until written notice is received by the Washington office of RFC that the purchaser will pay the new price for any deliveries.

RFC Offering Butadiene

RFC has also announced that beginning September 1 it will offer butadiene produced by the government for its synthetic rubber program to commercial purchasers. RFC said that butadiene produced in excess of its needs because of cut-backs in the synthetic rubber program permit this commercial offering. The material will be sold at 18c a pound, f.o.b. Gulf ports. This compares with a price of 12½c a pound for privately-produced butadiene of the petroleum variety. Very little of this material is available, however, except to those holding long-term contracts which were negotiated some time ago when costs were lower.

Heretofore, small quantities of alcohol-based butadiene have been available to the commercial trade from RFC at the almost prohibitive price of 39c a pound. This was ended, however, by the government's closing down of its alcohol-butadiene facilities. The last production unit was shut down on August 29.

RFC does not expect large initial sales of butadiene to commercial users, but it can meet any forseeable demand since it now has more than enough petroleum butadiene to meet current synthetic rubber requirements.

The 18c per pound price being asked by RFC, while higher than the contract price of private producers, is not considered by officials to be out of line with present market conditions in view of the higher costs that have occurred since the lower-priced material was first contracted for. The Defense Production Administration has urged industry to expand the production of butadiene to 162,000,000 pounds by 1954 and it is thought that the price being sought by RFC will serve as an inducement to private producers to reach the production goal.

Oil-Black Masterbatch Prices

On July 25, 1952, RFC set forth a new listing of oil and oil-black masterbatches, designated by "X" numbers. This complete listing will be found in our August, 1952, issue. On August 25, 1952, RFC set forth the prices of these various oil and oil-black masterbatch polymers, effective as of August 1. These prices follow:

Attend 1st Safety Congress?

The National Safety Council, 425 North Michigan Avenue, Chicago 11, Ill., is attempting to locate anyone who attended the First Cooperative Safety Congress at the Hotel Pfister in Milwaukee, Wisc. in October, 1912. NSC is holding its 40th Annual National Safety Congress, its annual convention, in Chicago, Ill., from October 20 to 24, and it wants to honor anyone who attended the first congress 40 years ago. Persons who attended that first congress, or persons knowing anyone who did, are requested to write Paul Jones at the council's Chicago address.

OIL MASTERBATCHES

Type	*Cents per lb.*
X-628	19.50
X-654	19.25
X-693	19.50
X-700	19.25
X-706	17.75
X-709	16.75
X-712	19.25
X-713	19.25
X-714	19.25
X-715	19.25
X-716	17.75
X-717	18.00
X-718	18.00

OIL-BLACK MASTERBATCH

Type	*Cents per lb.*
X-629	16.75

Savings From Cold Rubber

According to Colonel C. M. Hulings, operating vice-president of the Copolymer Corp., Baton Rouge, La., American motorists saved over $347,000,000 through the use of cold rubber in 69,000,000 passenger tires in the five-year period ending June 30, 1952. Approximately 685,000,000 pounds of cold rubber were produced in the year ended June 30, 1952, while more than four billion pounds of cold rubber have been produced since 1948.

Colonel Hulings attributed the savings to the increased mileage obtainable through the use of cold rubber in tire treads, estimated at more than 25%. At the same time, he said, motorists were riding in greater comfort and safety than ever before. Copolymer Corp., operated jointly by seven rubber companies and Sears, Roebuck and Co., was the first to produce cold rubber in its plant at Baton Rouge, La.

Study Group Ends Talks

A "working party" of the International Rubber Study Group, meeting in London in an effort to find a way to stabilize natural and synthetic rubber prices, has concluded its three-weeks meeting. It was reported that the meeting failed to produce any concrete plan for prevention of surpluses. However, it is understood that the working party will make one more attempt to come up with recommendations to the study group before the end of the year. The exact date and place has not been officially announced.

The three-week session was conducted behind closed doors and in the utmost secrecy. Nevertheless, it was reported that the talks took up chiefly the problem of possible "overproduction" of rubber as a result of the impending end to government stockpiling programs. Natural rubber growers have repeatedly voiced their concern over this prospect and the fact that the American synthetic rubber industry has been providing such formidable competition to the natural product.

One suggestion, championed by delegates from Ceylon, called mainly for setting up a "buffer stock" scheme. Under it, a special international organization would try to prop the price of natural rubber, buying it up when the price fell below a certain point and selling when it got very expensive. U. S. delegates, representing the State Department and RFC, were especially cool to the plan. Other delegates also failed to give it much support.

There were also several suggestions for the establishment of some sort of production restriction scheme for both natural and synthetic rubber. It is believed they also met with a cool reception.

Delegates from the United Kingdom representing Malaya and those representing the British government appeared to be most anxious for the United States to raise the price of synthetic rubber from the present 23c a pound to 26c to more nearly reflect the true costs of manufacturing synthetic were the job to be done by private industry.

The natural rubber growers were prophesying complete collapse of the natural rubber price structure not too long ago. However, the price has remained fairly stable for the past several weeks. The U. S. government's stockpiling program appears to be coming to no sudden halt, but it is being tapered off. Furthermore, production of natural rubber has been reduced to pre-Korea levels without the "disastrous" price drops which had been predicted.

If these conditions exist at the time of the next working party meeting, observers believe that any further price stabilizing schemes are likely to have rough going.

Other Natural Rubber News

As the working party of the International Rubber Study Group was meeting in London, other developments elsewhere in the world pointed up the general natural rubber picture. In Malaya, the Pan-Malayan Labour Party, that country's newest political party, called for the breaking up of Malaya's large plantations. These belong mainly to absentee shareholders, primarily British and American.

The party said that this was the alternative to outright nationalization of the industry. Malaya's basic industries should be nationalized, a party policy statement said. The party believes that Malaya's wealth is being drained to shareholders overseas at a time when the money can be spent

on social and welfare projects at home. Breaking up the large plantations would provide 10 to 20 acre small holdings to Malayan families, the party stated.

Meanwhile, reports from Ceylon state that impressive shipments of rubber are going from that country to Communist countries. Along these lines, the Department of Commerce recently reported that the free nations of the world supplied Russia and Communist China with about 82,000 tons of natural rubber in the first half of 1952. Great Britain was the chief supplier, shipping about 59,000 tons to Russia.

C. L. Pangborn, president of the National Association of Independent Tire Dealers, in a recent statement, decried this situation. He called for an immediate halt in the shipments of natural rubber by Britain and other free countries to Russia and Communist China.

The United States, meanwhile, is continuing its work on the development of a domestic source for natural rubber. The Department of Agriculture has reported excellent results from truck tires made from guayule. The new method begins with freshly harvested guayule. Previously, the guayule had been harvested and stored. This storing, apparently a factor in the weakness of the old-style extract, has been done away with. The department has given a superior service award to the group of chemists, engineers and technicians who produced this new guayule rubber.

DPA Plans Expansion Program

The Defense Production Administration has announced an interim expansion program for rubber and rubber products with a goal of $80,000,000 in new equipment and facilities or additions. Included in the program are special-purpose rubbers, excluding Butyl, reclaimed rubber, and such rubber products as logic wheels, supports, tank track blocks and bushings, fuel cells, military footwear, gas masks, hard rubber battery boxes and parts, proofed rubber goods, pontoons, life-saving equipment, aircraft and military vehicle parts, mechanical rubber goods, and other miscellaneous rubber products for defense. Tax amortization certificates covering $37,000,000 of the $80,000,000 goal have already been issued.

DPA has also announced that the total January, 1953, production capacity of 43 important chemical materials will be increased more than 50% over January, 1951, capacity. Of particular interest is the production goal announced for butadiene by January, 1953. Butadiene production will be increased 165% over January, 1951, levels. Sufficient facility expansion has already been assured for butadiene through the issuance of Certificates of Necessity.

The government agency also has revised its list of allotments and DO numbers used by federal claimant agencies in authorizing production and construction schedules and in making allotments of controlled materials. According to the new listing, dated July 22, the new CMP allotment and/or DO rating symbol for rubber is "S-6".

DPA has also announced fourth-quarter allotments of copper and aluminum to its various divisions. The Rubber Division, in the fourth quarter, will receive 3,510,000 pounds of copper and 880,000 pounds of aluminum. Third-quarter allotments for the division were 3,760,000 pounds of copper and 850,000 pounds of aluminum.

The Native Sulfur Industry Advisory Committee on July 22 unanimously recommended to NPA that it raise its present 25 calendar day inventory limitation on sulfur supplies to 60 calendar days. Sulfur inventories are presently limited to a 25-day supply at currently scheduled rates of operation under an amendment to NPA's Sulfur Order, M-69, issued November 9, 1951. This limitation, however, permits barge or vessel shipments which may amount to as much as a 3 or 4 month supply providing no additional inventories are received as long as inventories exceed requirements by the 25 calendar days. NPA stated that sulfur supply and requirements have become much more nearly in balance in recent months and estimated that inventories in the hands of consumers amount to about a 34-day supply.

Polyethylene Decontrolled

NPA, on August 12, eliminated its controls on polyethylene by revoking Schedule 5 to Order M-45. Polyethylene had been placed under allocation on May 11, 1951, because DO rated orders amounted to 36% of available supply in March, 1951, and were expected to increase to 50% of total production by July, 1951. NPA explained that production of polyethylene has been increased while military requirements have dropped. These factors permitted the decontrol action.

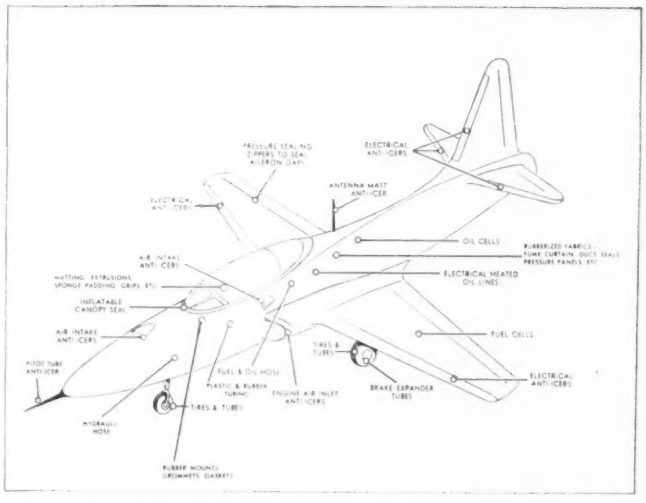
It has also been reported by NPA that cotton duck production during the second quarter of 1952 did not maintain the high rate of output established during the first quarter of the year. Total production during the second quarter amounted to 98,700,000 yards. The figure represents a decrease of 9,800,000 yards from the 108,500,000 yards produced in the first quarter of 1952.

Most of the decline in the over-all production can be accounted for by the shorter working hours during the period. In addition, two regular duck mills and 16 converted mills that had made duck during the first quarter were not producing in the second.

Israeli Tires for Sale in U.S.

Harold H. Purviance, general manager of the General Tire & Rubber Co. of Israel, announced on August 6 that his firm, now in commercial production, would begin selling tires to the Israeli public and would export 500 tires to the United States. General Tire is the first company to produce tires in Israel. The plant at Petah Tikva made its first tire on June 29. The tires produced are of all natural rubber. The new company has a capital of $1,168,000 and £712,000 (Israeli) of which 40% was put up by the General Tire & Rubber Co., the Palestine Economic Corp. of New York and a group of investors in the United States. The remainder was put up by Israeli investors.

RUBBER PRODUCTS VITAL TO JET AIRCRAFT POINTED OUT BY GOODRICH



The illustration above points up the rubber products which are vital to the operation of jet aircraft. Military jets flying into combat depend from "head to toe" upon essential rubber items. Some of these, as diagrammed above, range all the way from tires and tubes to anti-icers. B. F. Goodrich Co., which prepared this illustration, recently developed a new jet aircraft tire to meet the requirements of high-speed jet landings. The industry is continually conducting research to improve rubber aircraft products and to develop new ones to keep pace with rapidly-expanding jet production, the Goodrich company said.

GOODYEAR DESIGNS CONVEYOR FOR NEW YORK CITY'S SUBWAY SYSTEM

Goodyear Tire & Rubber Co. and the Stephens-Adamson Manufacturing Co. have designed and built a pilot model of a conveying system proposed for the carrying of 15,000 passengers an hour between Grand Central Terminal and the Times Square subway stations in New York City. The proposed system, as described in the April, 1951, issue of RUBBER AGE, is designed to replace the 34 year old subway shuttle now in service. The Board of Transportation of the City of New York has asked for $3,800,000 to install the new system. That amount has been earmarked for inclusion in the 1953 capital budget, now before the City Planning Commission.

Board of Transportation chairman Sidney H. Bingham, estimated the cost of the rubber conveyor system at $700 a foot, for a total of $1,750,000. The $3,800,000 request, he explained, was made to provide for necessary changes in alignment of existing tracks. Mr. Bingham noted that the conveyor, moving at 15 miles an hour between stations, would provide faster transportation for the 60,000 passengers who daily ride the half-mile each way.

The 68-foot test conveyor built specifically to record final engineering plans for the proposed conveyor belt subway system has passed all its tests satisfactorily after a year of continuous experimentation. Conclusions reached from these experiments are: (1) conveyor belt transport of human cargoes is safe, reasonably fast and economical; (2) the safest operating speed for a single belt in a system on which persons are required to enter by walking is 1½ miles per hour, and (3) a conveyor belt meets the subway requirement of intensive efficient utilization of equipment.

Actual Installation Simulated

Goodyear's passenger conveyor belt test installation simulates requirements of an actual installation, even to a moving handrail synchronized with the speed of the belt. Special testing equipment was devised for the experiments. Most interesting device is a vibration testing machine that, when placed on the moving belt, measures severity of vibration that would be felt by a person. The machine even records vibration shock that would be experienced by a heavy woman in spike heels, the most critical vibration test.

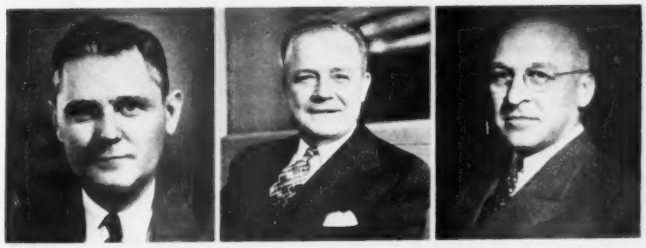
Beneath the belt, Goodyear engineers placed several different types of idlers or gravity rollers on which the belt rides. Some are steel and some are rubber-covered; some are wide-spaced, others are almost touching.

The actual shuttle replacement plan calls for the use of moving loading and unloading platforms and small, closely-spaced passenger cars riding on an endless track of rubber conveyor belts and rubber-tired banks of accelerator wheels. The moving platforms for loading and unloading passengers will be sufficiently apart to direct traffic flow into one-way streams, thus minimizing rush hour confusion.

At either end of the shuttle, passengers will walk directly aboard the loading platform, a moving belt, six feet wide. Alongside the loading belt, and moving at the same speed, 1½ miles per hour, will be a continuous stream of small passenger cars with seats. Twenty-five cars, each seating ten persons, will pass the loading platform every minute. After leaving the loading platform, the cars will be speeded up to 15 miles an hour over banks of accelerating wheels and on the main conveyor belts.

The cars will be slowed at the other end by similar banks of wheels and move onto a belt moving at unloading platform speed. Passengers will step out of the cars to the unloading platform, a moving belt similar to the loading platform, and walk off the far end. Empty cars will be turned around by means of a large wheel and move alongside a loading platform for passengers going in the opposite direction. The continuous operation feature will eliminate present waiting periods between shuttle trains and relieve rush hour congestion.

ANACONDA WIRE ANNOUNCES SEVERAL SHIFTS IN EXECUTIVE PERSONNEL



R. B. Steinmetz H. E. Thompson L. R. Love

Anaconda Wire & Cable Co., New York, N. Y., has announced the appointment of R. B. Steinmetz as vice-president in charge of manufacturing operations. L. R. Love has been named vice-president in charge of sales. Mr. Steinmetz was formerly general manager of mills while Mr. Love was previously general sales manager. D. E. Allen, associated with the company since 1932, has been named general sales manager succeeding Mr. Love.

To coordinate its product development and research activities under a planned, over-all company program, the company has created a new Research Department to include the Engineering Laboratories at Hastings-on-Hudson, N. Y.; the Magnet Wire Research Laboratory at Muskegon, Mich., under H. L. Saums; and the Rubber Products Development Laboratory at Marion, Ind., under H. C. Witthoft. The new director of research for the company is H. E. Thompson, formerly manager of quality control. E. L. Cuttleson has been named to succeed him as manager of quality control, Anaconda Wire announced.

Product development activities of the company will be guided by a Research and Development Committee recently formed. Its members include: L. F. Hickernell, chief engineer; D. E. Allen, sales manager, and R. B. Steinmetz, with Mr. Thompson as chairman. Mr. Thompson joined the company in 1932. He is a member of the American Institute of Electrical Engineers and of the American Society for Quality Control.

Holmes Joins Armstrong Tire

Frank O. Holmes has joined the Armstrong Tire & Rubber Co., Natchez, Miss., as technical director. Mr. Holmes was previously associated with the Goodyear Tire & Rubber Co., and formerly served as development manager of the Goodyear plant in Sweden. He is a former chairman of the Swedish Institution of Rubber Technology.

New Firestone Aircraft Tire

A revolutionary aviation tire that can hit a runway at 250 miles an hour has been announced by the Firestone Tire & Rubber Co., following a series of tests at the Wright Air Development Center, Dayton, Ohio. This is said to be the first tire of its size ever to meet the high-speed phase of requirements recently established by the Air Force. By using 170-mile-an-hour race tire construction principles that have been proved at the Indianapolis 500-mile race, the company has produced a tire that will successfully land at twice the speed now common to military planes. The tire was developed with high-strength nylon, and gum-dipped fabric incorporating racing-type construction and compounds. One of these tires has already survived 50 simulated landings at 250 miles an hour in tests conducted by Air Force engineers.

Sets Up $20,000,000 Credit

A $20,000,000 revolving credit has been established with the Guarantee Trust Co. of New York by the Columbian Carbon Co. The credit will be good until June 30, 1954. As a first step under the arrangement, the company has issued a $4,000,000 note with interest at 3% until June 30, 1953, and at 3¼% thereafter. At maturity in 1954 of borrowings under the credit line, Columbian Carbon will have the option of converting into a 3½% term note due June 30, 1963. The funds will be used to pay short-term loans and to bolster working capital.

ATOMIC ENERGY UTILIZED IN PRODUCT IMPURITY DETECTION

A new and highly accurate method of using atomic energy to detect and measure impurities in plastics and resinous materials, paints, pigments and related substances, fuels and other materials, has been developed by scientists of the Union Carbide and Carbon Corp. at Oak Ridge National Laboratory. The analysis technique, which should help manufacturers to improve the purity of the final product, is now being offered as a service to industrial, scientific, and other organizations, by arrangement of the Atomic Energy Commission through the Carbide and Carbon Chemicals Co., a division of Union Carbide. Union Carbide operates the laboratory for AEC.

Dr. C. E. Larson, director of the laboratory, explained that the analysis technique involves placing the test sample in the Oak Ridge graphite reactor, or "atomic furnace." The sample is thus exposed to neutron bombardment, and in this way the traces of impurities in the material are made artificially radioactive. Then, using highly sensitive instruments and detectors developed at the laboratory, the scientists can measure with great accuracy the exact quantities of impurities that may be present.

Dr. Larson pointed out that, in working with the new method, research personnel at the laboratory have noted it has several outstanding advantages not common to other methods of analysis. Properties revealed in its development indicates that it is extremely sensitive for detecting and measuring many chemical elements that occur in only slight traces, so slight that they cannot be determined by other chemical and physical testing processes. The method can be more specific than other techniques, since elements to be tested, when irradiated, produce artificially radioactive isotopes that have their own characteristics as to modes of "decay" and types of radiation. The characteristics are never exactly duplicated in any other radioisotopes produced.

The possibility of contamination that might interfere with testing, a matter that is often encountered in conventional analyses, is negligible in neutron-activation analysis, and exists only when the material irradiated contains large amounts of elements that strongly absorb neutrons. The new analysis method permits the examination of larger samples than the amounts usually used in conventional analyses, and it has an accuracy of ten per cent or better, Dr. Larson said.

The Activation Analysis Group of the laboratory's Analytical Chemistry Division, which has done much of the work of developing the technique, is conducting the analytical operations of the service, under the supervision of George W. Leddicotte. Its commercial aspects are being handled by the Radioisotope Control Department of the laboratory's Operations Division, in a manner similar to the radioisotope distribution plan.

Anyone interested in learning more about neutron-activation analysis should write to Carbide and Carbon Chemicals Co., Oak Ridge National Laboratory, P. O. Box "P," Oak Ridge, Tennessee. Attention: Radioisotope Control Department. The laboratory will furnish information as to how samples may be submitted and whether any particular analysis can be made with the new technique.

Forms New Subsidiary Firms

Diamond Alkali Co., Cleveland, Ohio, has formed two new subsidiary companies to handle its rapidly increasing volume of export sales. The new concerns, both incorporated in Delaware began activities on September 1. Diamond Alkali Inter-American Corp. will act as the sales outlet for Diamond chemicals in Latin America and other countries in the Western Hemisphere outside the United States. Diamond Alkali International, Inc., will serve all other areas of the world. Offices and facilities of both new companies will be at 122 East 42nd St., New York, N. Y. S. S. Savage has been elected president of both export companies.

Rubber Plant Maintenance

Maintenance problems in 11 industries, including the rubber industry, will be considered at the Plant Maintenance Conference which is to be held concurrently with the Plant Maintenance Show at the Public Auditorium in Cleveland, Ohio from January 19 to 22, 1953. Sixty-six separate sessions on maintenance problems are planned. Separate conferences will also be held for maintenance in small, medium and large plants. Further information on the show and the conference may be obtained from Clapp & Poliak, Inc., 341 Madison Avenue, New York 17, N. Y.

RFC Revises Specifications

The Synthetic Rubber Division of the Reconstruction Finance Corporation, Washington 25, D. C., has announced a number of revisions on specifications of "X" number polymers as of August 11, 1952. Specifications on the following polymers have been revised: X-628, X-629, X-634, X-693, X-700, X-706, X-709, X-712, X-713, X-714, X-715, X-716, X-717, and X-718. Complete details on the revised specifications may be secured from the Synthetic Rubber Division.

N. Y. GIFT SHOW FEATURES RUBBER AND PLASTICS ITEMS

Many rubber and plastics items were in evidence at the New York Gift Show held at the Hotels Statler and New Yorker in New York City from August 18 through 22. Many of the exhibits displayed toys produced by leading rubber manufacturers. Foam rubber stuffed toys, latex doll bodies and skins, balls and bath toys were among the items shown.

Many amusing rubber items were found among displays featuring gifts for pets. Among these were found chocolate-flavored rubber bones, balls, dumbbells and rubber whistle toys, as well as hard rubber combs and rubber-set brushes for pets. Fortunate is the cat who may receive for her gift a catnip-flavored rubber mouse!

Also seen at the show were rubber and vinyl coasters, and molded whiskey bottle dispensers. Vinyl-coated artificial flowers and leaves were attractively arranged for centerpieces and other home decoration purposes. Luggage and desk sets made of Neolite and similar materials were also to be seen, as were vinyl plastic wallets and novelties.

Also of interest among the novelties shown were chocolate syrup and catsup dispensers made of polyethylene. The catsup dispenser comes in the form of a ripe red tomato with green stem while the chocolate syrup dispenser is attractively designed for children in the form of a colorful honey bear.

The gift show also featured exhibits of various coated papers, vinyl place mats and tablecloths, and many other interesting items. Of particular interest at this years' show was the fact that many of the products exhibited were attractively packaged in polyethylene and vinyl bags. Packages were secured by handsome and versatile adhesive tapes, designed to enhance the attractiveness of the gift.

Difficulties Mar Bridge Paving

Difficulties in no way attributed to the rubber compound marred the recent laying of a rubberized-asphalt pavement on the Michigan Avenue Bridge over the Chicago River in Chicago, Ill. The compound, developed by the Goodyear Tire & Rubber Co., called for a mixture of rubber pellets bound with asphalt. Under the direction of the Berry Asphalt Co., the bridge was paved. On the day the surface was laid, the temperature was cool. The next day, however, was extremely warm, and the surface began to ooze. It was determined that the asphalt was at fault and as a temporary expedient the local contractor covered the bridge surface with sand. Most of the sand, however, was blown away and the balance lost when the bridge was raised for a passing boat. For the time being, the experiment is being written off as unsuccessful. It should be noted that the same type of material has been used successfully in many areas of the United States.

Another copy of RUBBER AGE needed in your office? Use the coupon on page 831.

NEW BARRETT DIVISION LABORATORY HAS LATEST TESTING EQUIPMENT

As reported in the August issue of RUBBER AGE, the Barrett Division of the Allied Chemical & Dye Corp. opened its new laboratory in Edgewater, N. J., on July 11. Known as the Shadyside Applications Research Laboratory, the new installation is designed to develop and test materials used in the manufacture of rubber products, plastics, insulating materials, paints, laminates and a wide range of other products. The laboratory is in charge of D. A. Rankin, superintendent.

Incorporating the latest rubber testing equipment, a test batch of rubber can be mixed in a Banbury, milled on any one of five two-roll mills, calendered, pressed or extruded. There are also two abraders, a Goodyear-Healy Rebound Tester, ultraviolet and infrared light sources for measuring light stability, constant-temperature ovens, and a variety of flex-testing machines including Ross, De Mattia and Goodrich Flexometer.

Of particular interest is the modern tensile testing equipment. In addition to two Scott Tensile Testers normally used for testing rubber and rubberlike materials, the new Barrett laboratory is equipped with the new Instron electronic tester, which can be used to test within narrow limits and over a wide range. The load range of this instrument is from 0 to 5,000 pounds, yet a reading can be obtained between 0 and 2 grams.

One of the six mills available at the laboratory is shown above. Between the 18-inch rolls can be seen a "bank" of rubber compound, while to the rear an operator is "sheeting off" the fluxed material for testing.

This extruder is used to form rubber compounds into continuous tube, hose or gasket stock at the laboratory.

A special feature of the laboratory is that both the Instron and Scott Testers are kept in a constant-temperature room, which permits most accurate testing. A fourth tensile-testing instrument is available for testing under controlled conditions. It is designed specifically for testing at high and low temperatures, and can be used from —70° F. to +300° F. In addition, there are complete facilities for the testing of dielectric properties, including a 150,000 volt transformer used for dielectric strength measurements.

The new laboratory itself is a red brick building with structural steel frame and continuous steel sash. It is 170 feet in length and 74 feet in width, with a second story section 50 feet long. It has concrete floors. There is also an extension to the existing laboratory at Edgewater which is 46 by 60 feet, of reinforced concrete construction, with two stories and a basement. Access to the building is by means of an enclosed passageway joining the new building to the expanded portion of the present building.

In the main, the first story of the new building houses the processing and testing equipment, while the second floor provides space for specialized laboratories and a special room for research conferences and discussions with Barrett customers.

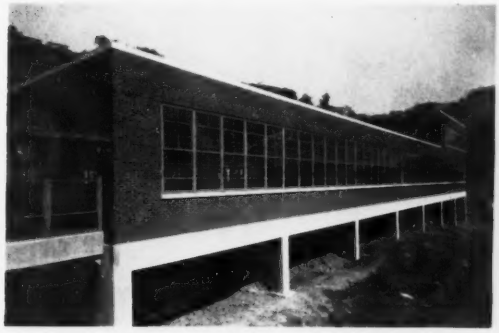
Every effort has been made in the design and construction of the building to provide a structure which will enable Barrett to give maximum service to its industrial customers, who in turn will be better able to serve the utimate consumer.

Reorganizes Manufacturing Division

Western Electric Co. has announced the reorganization of its manufacturing division into eastern and western operating areas as of September 1, and the reassignment of several company offices and executives. Reese F. Clifford, recently elected a vice-president of the company and formerly manager of the Hawthorne Works of the company, will head the western area with headquarters in Chicago, Ill. Clyde C. Randolph, formerly personnel director in the New York headquarters, has been named to succeed Mr. Clifford as works manager at Hawthorne. Noble Armstrong, formerly works controller at Hawthorne, has been named assistant plant manager there succeeding C. R. Smith, who has been named works manager of the Indianapolis, Ind., plant. P. R. Brousse, previously manager of the western distribution zone, has been appointed Hawthorne works controller.

Reports on TC Rubber

The latest issue of *Rubber Developments*, copies of which are available from the Natural Rubber Bureau, 1631 K Street, N. W., Washington 6, D. C., contains a full report on the progress being made in the field of technically classified rubber to date. It explains the methods used to obtain TC rubber on the plantation and the reactions and results being obtained by the consumers. The new issue also contains an article on the "whys" of preference for natural rubber latex.



This photograph shows the new building which houses the Shadyside Applications Research Laboratory at Edgewater, N. J. This building is located behind the old laboratory.

The Rubber Application Testing Section of the new laboratory is depicted above. T. A. Bullifant, head of rubber research at the laboratory, is shown in the left foreground.

PCFA REPORTS ON FIRST HALF COATED MATERIAL SHIPMENTS

Plastic-coated materials and all-plastic sheeting shipments for the first six months of 1952 exceeded shipments in the comparable period of 1951 by 1,201,354 linear yards and 2,080,880 square yards, respectively, according to figures released recently by the Plastic Coatings & Film Association, New York, N. Y. The report covers shipments of association members and cooperating companies who represent a substantial majority of the nation's output of plastic-coated fabrics, all-plastic sheeting and pyroxylin-coated materials.

Paul F. Johnson, secretary of the association, stated that according to member companies, current inventories are somewhat low. Both shipments and incoming orders for plastic-coated materials and all-plastic sheeting are at a satisfactory level, he said. June shipments for the two types of materials were above the average for the first 6 months of the year.

Shipments of plastic-coated materials by association members and cooperating companies for the first half of 1952 were 22,009,793 linear yards compared to 20,808,439 yards for the first half of 1951. Heavy weight coated fabrics (over 10 ounces per square yard) registered the greatest gains with shipments totaling 18,954,458 linear yards in the first 6 months of 1952 as compared to 17,593,486 yards in the comparable period last year. A yardage of 2,137,301 of light weight coated fabric (10 ounce and under) was shipped in the first half of 1952 compared to 2,277,316 yards in the first half of 1951. Custom coated materials accounted for 918,034 yards in 1952 as against 937,637 in the comparable 6-month period last year.

All-plastic sheeting shipments for the first half of this year as reported to the PCFA, were 28,570,307 square yards compared to 26,499,427 yards in 1951. Shipments of medium weight sheeting (10 to 15 mils inclusive) in the first half of 1952 came to 17,756,760 square yards as against 17,405,426 yards in the comparable period in 1951. Medium-heavy weight sheeting (from 16 to 19 mils inclusive accounted for 1,384,034 square yards of material in the first 6 months of 1952 as compared to 544,408 yards in the same period in 1951. Sheeting 20 mils and over accounted for 9,429,513 yards in the first 6 months of 1952 as compared to 8,549,593 yards in the same period last years.

Reports to the PCFA on pyroxylin-coated material shipments for the first 6 months of 1952 totaled 15,602,399 linear yards as against 22,109,452 yards in the same period last year. Pyroxylin-coated shipments for the first half of this year were: light cotton fabrics, 5,995,306 linear yards; heavy cotton fabrics, 3,420,306 yards; non-fabric materials, 573,768 yards; and custom coating, 5,613,019 yards.

Printed copies of "Simplified Practice Recommendation R85-52, Adhesive Plaster," and "R86-52, Surgical Gauze," are now available at 5c each from the U. S. Printing Office according to the Commodity Standards Division of the Office of Industry and Commerce, U. S. Department of Commerce.

Wright Retirement Announced

Carl J. Wright

Godfrey L. Cabot, Inc., Boston, Mass., has announced the retirement of Carl J. Wright, vice-president and general manager of the General Atlas Carbon Co., Cabot subsidiary in Pampa, Texas. Mr. Wright will continue to be associated with the Cabot companies in a consulting capacity.

Born in Hayfield, Minn., Mr. Wright was graduated from Rensselaer Polytechnic Institute where he received his B. S. degree in electrical engineering. Immediately thereafter he joined the staff of the Denver Gas and Electric Co., a subsidiary of the Cities Service Co., as a junior engineer. In 1917, he was transferred to Toledo, Ohio, where he worked with the Industrial Heating Department of Henry L. Doherty & Co.

In 1922, he became head of the Research Division of the Combustion Utilities Corp. and undertook special research project work with the late Henry L. Doherty, then president of Cities Service. During this time, Mr. Wright worked on the General Atlas process for producing semi-reinforcing blacks. He pioneered the development of a gas furnace burner for the production of carbon black, and in 1927 built the first carbon black plant to employ the use of this burner. For this work, Mr. Wright has often been called the father of the gas furnace type process of carbon black manufacture.

In 1945, Godfrey L. Cabot, Inc. purchased the original plant, a second plant built in 1939, and the assets of the General Atlas Carbon Co. Mr. Wright, who had been a vice-president of General Atlas, retained his position of vice-president and general manager of General Atlas under Cabot ownership. Active in numerous technical and social organizations, Mr. Wright has served on various ASTM and ASME technical committees. He is also a past-chairman of the New York Rubber Group.

A testimonial was tendered Mr. Wright recently in recognition of his fine record of service. Mr. and Mrs. Wright will make their new home in Fort Collins, Colo.

KENTUCKY SYNTHETIC CONVERTS TO PRODUCTION OF COLD RUBBER

Kentucky Synthetic Rubber Corp., Louisville, Ky., has announced that its $1,300,000 plant conversion program for making "cold" rubber has been substantially completed and that the company is now in production of this type of rubber.

Concurrently, it was announced that the company will shortly establish a headquarters office in Stamford, Conn. It was pointed out that 9 out of the 11 non-tire manufacturing companies which sponsor and control Kentucky Synthetic have their executive offices and some of their larger plants in or around this area.

Emphasizing the fact that Congress has recently passed a law requiring that a plan for turning the presently government-owned plants over to private industry shall be worked out within the next 18 months, Thomas Robins, Jr., president of the company, stated that Kentucky Synthetic is taking this step so as to be ready to meet the various financing, procurement and sales problems that may be expected to accompany the transfer of any of the synthetic rubber plants to private ownership.

It was also announced that Dr. Henry F. Palmer, formerly general manager of the company plant in Louisville since its reactivation in 1950, has been elected a vice-president of the corporation and will move to Stamford on or about November 1. During World War II, Dr. Palmer headed the Production Division of the Reconstruction Finance Corporation which directed, with the cooperation of the rubber industry, the construction and operation of the entire government synthetic rubber program.

Howard R. Erwin, formerly director of engineering for Kentucky Synthetic, has been named to succeed Dr. Palmer as plant manager at Louisville. Howard W. Cable, formerly production manager, has been promoted to the post of assistant plant manager.

At a meeting of the board of directors of the company on August 14 in New York City, Raymond F. Hart was elected treasurer of the corporation. Y. J. Riveiro was re-elected controller.

Eleven non-tire rubber companies participate in the ownership and management of the Kentucky Synthetic Rubber Corp. One of them, the KYS Corp., consists of a group of nine footwear manufacturing concerns. The other ten are: Hewitt-Robins Inc., of which Mr. Robins is president; American Hard Rubber Co.; Boston Woven Hose & Rubber Co.; Brown Rubber Co.; Goodall Rubber Co.; Raybestos-Manhattan, Inc.; Sheller Manufacturing Corp.; Simplex Wire & Cable Co.; Sponge Rubber Products Co.; and the Thiokol Corp.

Kenneth H. White Co. of Detroit, Mich., has been appointed agent for napthenate, tallate and octoate driers in the Detroit area by the Witco Chemical Co.

Goodrich Chemical has opened a new field sales office at 1339 Chestnut St., Philadelphia 7, Penna. The telephone number is LOcust 4-2245.

YALE RUBBER MANUFACTURING COMPLETING $1,000,000 PLANT

Yale Rubber Manufacturing Co., designers and producers of miscellaneous molded and extruded specialties as well as belting, packings, rolls and tubing, will begin operations in their new $1,000,000 plant in Sandusky, Mich., on October 1. The new plant will more than double the firm's previous production capacity. The announcement of the plant's opening was made by E. H.

E. H. Henderson

President of Yale Rubber

Henderson, president, who said that the new facilities will represent the completion of the most ambitious expansion project undertaken by the company.

Construction of the 85,000 square foot plant was a major phase of the company's over-all plan to expand and streamline operations in the field of rubber production, engineering, sales and service on a nation-wide scale. Under a single roof, company officials pointed out, there has been assembled the most advanced technological methods to achieve high precision and quality in the molding, punching, extrusion and calendering of Yale Rubber Products.

Giffels and Vallet, Inc., associated engineers and architects of Detroit, Mich., specialists in rubber plant layout, planning and construction, have so designed the production area of the new plant that all operations are completed in the one building. Yale Rubber will also step up its assembly-line system for the production of rubber-to-metal bonded parts.

Yale Rubber maintains a branch office at 3530 Fort Street in Detroit, Mich., with sales offices in all the larger cities of the country. Company officers, other than Mr. Henderson, include Lyle F. Runciman, vice-president; R. C. Henderson, treasurer; and W. D. Hough, secretary.

1,000,000 Tubeless Tires Sold

According to the B. F. Goodrich Co., Akron, Ohio, more than 1,000,000 tubeless tires have already been sold, while production of the tires in Goodrich plants is nearly triple that of last year. The tire is now being made in four of the company's five tire plants throughout the country.

GEDA for Rubber and Textiles

Goodyear Aircraft Corp., Akron, Ohio, has announced the development of a new electronic "brain." Called the "L3 GEDA" (Goodyear Electronic Differential Analyzer), the computing device ferrets out inefficiencies in machines, methods and materials, enabling designers in both the rubber and textile fields to perfect far more productive equipment. The analyzer solves problems in terms of voltages and wave forms, which are transcribed onto paper in allied recording machines, and interpreted by trained technicians. Problems of direct simulation are answered through a study of electrical and mechanical circuits. By substituting different voltages in the L3 GEDA for the different parts of an equation, any problem of motion that can be transferred into a mathematical equation can be solved.

Emergency Requirements Rescinded

Underwriters' Laboratories, Inc., New York, N. Y., has rescinded the February 15, 1951 Emergency Requirement for Flexible Cord and Fixture Wire, this revocation to become effective on November 1, 1952. On and after this date there will be no remaining emergency requirements applicable to this classification, and all the requirements of the new edition of the Standard will be in effect, except for certain dielectric-strength and insulation-resistance tests which will become effective on January 2, 1953.

New Plant for United Carbon

United Carbon Co., Inc. of Charleston, West Va., has announced the completion of their Ivanhoe plant at United, Louisiana. The new plant combines the newest engineering designs and advanced research in furnace black manufacture and is expected to aid materially in fulfilling the demand for more and better quality HAF oil-base black. The plant has a capacity of more than 30,000,000 pounds of black a year.

NAITD SETTLES SUIT AGAINST B. F. GOODRICH AND GULF OIL

Latest news in the continuing legal struggle between tire manufacturers and dealers came when the National Association of Independent Tire Dealers settled its suit against the B. F. Goodrich Co., the Gulf Oil Corp. and the Gulf Tire & Supply Co. Filed three and one-half years ago, NAITD and eight of its members charged the companies with "monopolistic practices." NAITD charged the defendants engaged in a program to induce Gulf dealers to purchase tires exclusively from Gulf, and that they monopolized the distribution of tires to such dealers through this action.

Goodrich, who makes Gulf tires, was accused of selling casings to the oil firm at substantially lower prices than those charged its independent dealers. In reaching what literally amounts to a truce, attorneys signed an agreement that was approved by Federal Court in Washington, D. C. The dealers pointed out that the case was dismissed "without prejudice" which allows them to reinstate the proceedings should "the need arise."

Tire companies and their dealers, meanwhile, had a new ally in their fight against the Federal Trade Commission proposal to limit the discounts manufacturers can grant on wholesale purchases. A recent suit filed in Federal District Court in Washington by the American Oil Co. challenged the FTC's pending regulations. American Oil is a subsidiary of Standard Oil. Its complaint insists that the FTC proposal would force the company out of the retail tire business and would in the end increase the retail price of tires to the public.

American Monomer Corp., Leominster, Mass., has announced price reductions for four monomers heretofore available only in laboratory quantities. The four monomers are: ethylene glycol dimethacrylate, cyclohexyl methacrylate, monomer MPL and butyl acrylate.

Shown above is an artist's conception of the new $1,000,000 plant constructed for the Yale Rubber Manufacturing Co. in Sandusky, Mich. The new plant features a one-story layout with greater light and ventilation areas designed for better working conditions. The west wing of the new plant contains the executive offices.

Kinsella Appointed President

T. J. Kinsella

T. J. Kinsella, formerly executive vice-president of the Barrett Division of the Allied Chemical & Dye Corp., has been appointed president of the division. Mr. Kinsella came to Barrett in January, 1947. From 1941 to 1947, he was Price Executive of the Industrial Machinery Branch of the Office of Price Administration, as well as O.P.A. representative on the War Procurement Policy Board. Previous to his Washington experience, Mr. Kinsella conducted his own auditing practice in Albany, N. Y., and served as assistant professor of commerce at Albany State College. He holds M. A. and Ph. D. degrees from Clark University, Worcester, Mass., where he held a graduate fellowship and assistantship from 1930 to 1932. Before his graduate work, Mr. Kinsella spent two years in the Fabrikoid plant of E. I. du Pont de Nemours & Co., Inc. at Newburgh, N. Y.

More Certificates of Necessity

The Defense Production Administration has issued a new list of approved Certificates of Necessity for accelerated tax amortization on new or expanded defense facilities. Certificates issued recently include:

Whitney Blake Co., Hamden, New Haven, Conn., $250,000 for field wire for the Signal Corps.

U. S. Rubber Co., Passaic, N. J., $9,967 for testing equipment for military end-items.

Publicker Industries, Inc., Eddington, Penna., $4,309,000 for butadiene.

Precision Rubber "Dyna-Seal"

Precision Rubber Products Corp., Dayton, Ohio, has announced the development of a new and thoroughly-proved face-to-face seal, the "Dyna-Seal." The new product comprises a synthetic rubber sealing member bonded to a steel ring. It finds use in sealing flat surfaces, bolt heads, rivet heads, flanges and special fittings. No grooves are required and it will seal all pressures against water, all types of petroleum products and many other fluids and gases, the company states.

Executives Promoted at Witco

Witco Chemical Co., New York, N. Y., has announced a reorganization of its executive staff. William Wishnick has been named assistant to the president, while J. J. Tumpeer has been named national asphalt sales manager. B. W. Lewis has been appointed midwest asphalt sales manager, and J. A. Raggio has been named eastern asphalt sales manager. W. F. Twombly has been placed in charge of product development, and J. H. Wishnick placed in charge of the Chicago and Lawrenceville, Ill., plants. Stanley Trimble has been appointed controller of the company. In other appointments, Thomas J. Starkie was named national chemical sales manager, with E. F. Wagner as assistant national chemical sales manager. C. A. Damen has been named assistant vice-president in charge of the company's Washington office, while M. A. Minnig has been named national sales manager of rubber chemicals with H. Brubacker as assistant national sales manager of carbon black.

$550,000 Building for Firestone

A new $550,000 tire warehouse adjoining Plant 2 of the Firestone Tire & Rubber Co. at Akron, Ohio, is nearing completion according to a recent company announcement. Covering 65,000 square feet, the new warehouse provides storage and shipping facilities for 45,000 passenger car tires. The warehouse will make possible increased production of tires and defense products because it will release floor space in Plant 2 now being used for storage. The most notable feature of construction of the new 1-story building was the relocation of a railroad siding without interruption of shipping schedules. Two railroad tracks now run through the building with the warehouse area located between them. This provides for inside loading of freight cars and for more space for loading on each track.

New Underwriters' Standards

Underwriters' Laboratories, Inc., New York, N. Y., has issued a new edition of its Standard for Flexible Cord and Fixture Wire, dated July, 1952. This is the fourth edition and supersedes the edition of October, 1935. The new edition of the standard has been prepared as a result of careful study by the Laboratories' staff; it has been reviewed and discussed with manufacturers of labeled flexible cord and fixture wires, and with others known to have an interest in these requirements; and it has been approved by the Laboratories' Electrical Council.

Correction

Our attention has been called to an error which occurred under "Reinforcing Agents" in the Market Prices Section of the August, 1952, issue of RUBBER AGE. Under the heading "Furnace, Fine (FF)" appeared Statex 125 at a price of .1100—.1550c. This listing should have read, Statex B at .0650—.1050. Statex 125 was correctly listed under "Furnace, Super Abrasion (SAF)."

Pacific Lumber Names Van Beckum

William G. Van Beckum

William G. Van Beckum, formerly associated with the Weyerhaeuser Timber Co., has been named director of research and development for the Pacific Lumber Co., San Francisco, Calif., where he will work on the further development of redwood by-products for use in rubber compounding. Since 1948, Mr. Van Beckum had been manager of technical service and assistant sales manager of the Special Products Division of Weyerhaeuser Timber. A graduate of St. Norbert College and the University of Wisconsin, he worked under a TAPPI Fellowship for three years at the U. S. Forest Products Laboratory at Madison, Wisc. In 1939, he joined the Wood Conversion Co., and in 1942 was named chief of the Chemistry Section of the Weyerhaeuser Development Department, of which he was named assistant manager in 1946. Pacific Lumber production facilities are located in Scotia, Calif. Mr. Van Beckum will make his headquarters at the company offices in San Francisco.

Argentina Curbs Rubber Imports

Tire manufacturers in Argentina were recently advised by the government that they would be unable to import rubber and other materials for the production of tires until next June. Argentina has been importing an average of 1,800 tons of rubber a month, mostly from Singapore. Manufacturers have submitted plans for an immediate 50% cut in production, while a complete shutdown is expected by April, 1953. Meanwhile all plants are still operating at 100% of capacity and eating into their stocks at a rate which promises an even earlier shutdown.

Increases Authorized Common

At a special meeting held on September 2, stockholders of the Boston Woven Hose & Rubber Co., Boston, Mass., voted to increase the authorized common stock of the company from 86,000 to 344,000 shares without par value. It was further voted to distribute to stockholders of record at the close of business on September 5, three additional shares of no-par value stock for each share of its then outstanding no-par value stock.

RMA CRUDE RUBBER COMMITTEE COMPLETES PROGRAM ON RUBBER SEMINARS

As reported in our July issue, a special program is being launched by the Crude Rubber Committee of the Rubber Manufacturers Association, headed by W. J. Sears, designed to assist rubber manufacturers to secure full value from their crude rubber purchases. This program has now been completed, and further details have been made available by the Association.

Since the program is primarily designed to be educational rather than promotional, and since it is the RMA's objective that every individual attending the meetings have ample opportunity to obtain answers to his questions on a personal basis, the program has been revised to a two-day affair in each of the scheduled cities. Dates, cities and locations now on the schedule are as follows:

Sept. 15-16 — Akron, Ohio — Mayflower Hotel Ballroom.
Sept. 30-Oct. 1—Trenton, N. J.—Stacey-Trent Hotel Ballroom.
Oct. 14-15 — New York, N. Y. — Hotel Statler Georgian Room.
Oct. 21-22—Boston, Mass.—Hotel Somerset Louis XIV Ballroom.
Nov. 18-19—Chicago, Ill.—Hotel Congress Gold Room.
Dec. 9-10 — Los Angeles, Calif. — Statler Hotel.

In addition to the above, a panel exhibit and display of RMA type samples will be shown during the three-day meeting of the Rubber Division, A.C.S., to be held on October 29-31 at the Hotel Statler in Buffalo, N. Y. Mr. Sears will present a paper dealing with crude rubber quality and packing problems and inspection procedures, but there will be no formal seminars of the type scheduled for the other cities listed above.

The program for the two-day meetings to be held in various rubber manufacturing centers, as per the schedule outlined above, will be as follows:

FIRST DAY

10:00 A.M.—Presentation of papers by members of the RMA Crude Rubber Committee.

1. National rubber quality trends since World War II and the functions of the RMA Crude Rubber Committee.
2. The historical development of and the present purpose of RMA natural rubber type samples and type descriptions.
3. The purpose of and the effectiveness of RMA natural rubber packing specifications.
4. Rules and regulations (contract terms) covering transactions between sellers and factory buyers of natural rubber.

11:30 A.M.—Recess.

11:45 A.M. — Accepted methods for the visual inspection of natural rubber against official type samples.

12:30 P.M.—Color movie film showing arrival, discharge and inspection of cargo of natural rubber.

1:00 P.M.—Luncheon.

2:30 to 5.00 P.M.—Visitation by individuals to natural rubber quality and packing display and individual examination of official RMA type samples for all types and grades of natural rubber. Members of the Type Sample Committee will be in attendance to answer any questions on rubber types and grades as well as individual questions on inspection procedures.

SECOND DAY

10:00 A.M. — Question and answer session. A panel of experts on natural rubber procurement, quality and inspection will answer any questions from the floor. (Provision will be made for submission of written questions in advance.)

11:00 A.M. — Inspection Demonstration. Persons attending are invited to bring samples of natural rubber they have bought on which they may question the accuracy of the type or grade. Experienced natural rubber inspectors will compare such samples with official types and will classify as to correct type and grade. If the date and grade purchased and cost are shown on the sample, a qualified judgment will be given as to the proper allowance that should have been sought. Company identification will be kept confidential if desired.

12:30 P.M.—Concluding remarks.

1:00 P.M.—Luncheon.

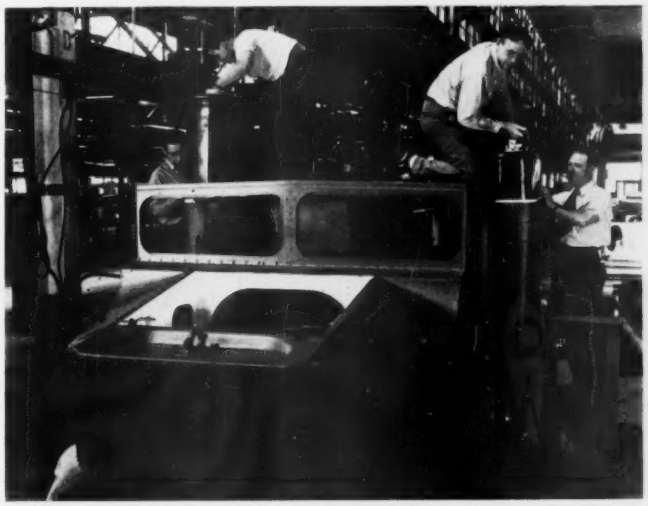
2:30 to 5:00 P.M. — Visitation by individuals to natural rubber quality and packing display and individual examination of official RMA type samples for all types and grades of natural rubber. Members of the Type Sample Committee will be in attendance to answer any questions on rubber types as well as individual questions on inspection procedures.

The educational meetings are open to all rubber manufacturing companies regardless of affiliation with the Rubber Manufacturers Association. It is the objective of the Association to specifically acquaint all rubber manufacturers with the most effective and efficient methods of purchasing and inspecting natural rubber.

Meiser and Jared Promoted

The Industrial and General Products Division of the B. F. Goodrich Co. has announced the appointment of Robert E. Meiser as manager of reclaim sales and E. Bryan Jared, Jr. as manager of adhesives cements and packaging. Mr. Meiser came to Goodrich in 1939 upon his graduation from Purdue University with a degree in chemical engineering. He was formerly a sales representative in industrial products. Mr. Jared was also a sales representative in industrial products. He is a graduate of Akron University.

BULLET-SEALING FUEL CELLS INSTALLED ON AMPHIBIOUS VEHICLES



Bullet-sealing fuel cells, which saved thousands of lives of airman and millions of dollars worth of airplanes and equipment during World War II and the Korean conflict, now have been successfully adapted to ground and amphibious vehicles by the Firestone Tire & Rubber Co. The new Army Otter, amphibian cargo tractor, is shown above being equipped with the Firestone safety cells. Replacing metal fuel cells, the twin rubber gasoline cells provide a double safety factor in that bullet holes seal themselves immediately and the rubber, unlike metal, absorbs jolts, jars and twisting stresses and strains without breaking open at the seams. The Otter is a speedy and highly maneuverable amphibian vehicle that operates efficiently on land, in water, through swamps and over snow and ice.

Rubber Division Fall Meeting

Preparations for the Fall Meeting of the Division of Rubber Chemistry to be held in Buffalo, N. Y., on October 29-31 are nearing completion. Committees under John G. Augenstein (U. S. Rubber Reclaiming), general chairman, are finishing up various parts of the program on which they have been working for the past few months. The Hotel Statler in Buffalo will be convention headquarters. Members will be notified shortly of plans for handling advance registration. The program for the three day meeting will include a choice of field trips to various industries in the area. A program of entertainment for the ladies is also being planned. It is estimated that upwards of 1000 persons will attend the meeting and the committee in charge of housing has already been assured of sufficient hotel accommodations for everyone who plans to attend. The following members are chairmen of committees working on the meeting:

Paul Sick (Hewitt-Robins)—*Equipment, Program and Meeting Rooms.*

Charles Miserentino (Dunlop Tire)—*Registration.*

Charles Smith (U. S. Rubber Reclaiming)—*Finance.*

Russell Schutz (U. S. Rubber Reclaiming)—*Housing and Information.*

William Sauter (DuPont) and E. C. Siverson (Buffalo Weaving and Belting)—*Plant Visitations and Transportation.*

Mrs. C. H. Peterson and Mrs. R. Cowen—*Ladies' Entertainment.*

Donald Bradley (Commercial Chemicals)—*Banquet and Entertainment.*

Philadelphia Holds Outing

Approximately 170 members and guests attended the annual outing of the Philadelphia Rubber Group held on August 22 at the Cedarbrook Country Club, Mount Airy, Philadelphia, Penna. G. J. Wyrough (R. E. Carroll) served as chairman of the Outing Committee. R. A. Kurtz (DuPont) was chairman of the Prize Committee, while W. R. Cleary (Barrett) served as chairman of the Golf Committee. The Donations Committee was headed by A. J. DiMaggio (Firestone). Low gross honors for the day in the golf tournament went to Ed Osborne (Goodrich Chemical). Ralph Harper of the Aero Materials Laboratory, U. S. Naval Base Station, won high gross honors. A cocktail hour and dinner was followed by a drawing for prizes. Every member received a door prize.

Vulcan 9 Oil Furnace Black

Godfrey L. Cabot, Inc., Boston, Mass., has announced the production and commercial availability of "Vulcan 9", a new super abrasion furnace black (SAF). An oil furnace black, Vulcan 9 is said to give 40% better wear than standard HAF, and higher tensile strength than other standard types of furnace black. The production of Vulcan 9 marks another step in the Cabot program initiated ten years ago to meet threatened gas shortages and rising natural gas prices.

Coming Events

Sept. 25. Ft. Wayne Rubber and Plastics Group, Hotel Van Orman, Ft. Wayne, Ind.

Oct. 3. Detroit Rubber and Plastics Group, Detroit-Leland Hotel, Detroit, Mich.

Oct. 7. Los Angeles Rubber Group, Hotel Mayfair, Los Angeles, Calif.

Oct. 9. No. California Rubber Group, Elks Club, Berkeley, Calif.

Oct. 17. Akron Rubber Group, Mayflower Hotel, Akron, Ohio.

Oct. 17. Boston Rubber Group, Hotel Somerset, Boston, Mass.

Oct. 20-24. 40th National Safety Congress and Exposition, Chicago, Ill.

Oct. 24. New York Rubber Group, Henry Hudson Hotel, New York, N. Y.

Oct. 29-31. Rubber Division, A.C.S., Fall Meeting, Hotel Statler, Buffalo, N. Y.

Nov. 6. No. Carolina Rubber Group, Elks Club, Berkeley, Calif.

Nov. 11. Los Angeles Rubber Group, Hotel Mayfair, Los Angeles, Calif.

Nov. 14. Connecticut Rubber Group Fall Meeting.

Nov. 21. Chicago Rubber Group, Morrison Hotel, Chicago, Ill.

Dec. 4. Ft. Wayne Rubber and Plastics Group, Hotel Van Orman, Ft. Wayne, Ind.

Dec. 12. Boston Rubber Group, Hotel Somerset, Boston, Mass.

Dec. 12. Detroit Rubber & Plastics Group, Xmas Party, Detroit-Leland Hotel, Detroit, Mich.

Dec. 12. New York Rubber Group Xmas Party, Henry Hudson Hotel New York, N. Y.

Dec. 13. So. Ohio Rubber Group, Miami Valley Golf Club, Dayton, Ohio.

Dec. 16. Buffalo Rubber Group, Xmas Party.

Dec. 19. Chicago Rubber Group, Xmas Party, Morrison Hotel, Chicago, Ill.

Mar. 18-20, 1953. Rubber Division, A.C.S., Hotel Statler, Los Angeles, Calif. (In conjunction with 122nd meeting of A.C.S.).

May 27-29, 1953. Rubber Division, A.C.S., Spring Meeting, Hotel Statler, Boston, Mass.

Sept. 9-11, 1953. Rubber Division, A.C.S., Fall Meeting, Hotel Sherman, Chicago, Ill.

Akron Polymer Lectures Set

The Akron Polymer Lecture Group has scheduled a series of nine lectures for its 1952-53 season. All lectures will be held at Knight Hall in the University of Akron, Akron, Ohio. Secretary of the group is C. I. Parrish of the Government Laboratories at the University. The following lectures have been scheduled:

September 5—"Polyelectrolytes and the Mechanism of Soil Conditioning" by Dr. Robert A. Ruehrwein (Monsanto Chemical).

October 3—"Hydrogenated High Polymers" by Dr. W. B. Reynolds (Phillips Petroleum).

November 7—"Stabilization of High Polymers" by Dr. Carl B. Havens (Dow Chemical).

December 5—"Structure Versus Properties in Hydrocarbon Polymers" by Professor William J. Bailey (University of Maryland).

January 9, 1953—"Graft Polymerization" by Professor Herman F. Mark (Polytechnic Institute of Brooklyn).

February 6, 1953—"Polyester Resins" by Dr. H. L. Gerhart (Pittsburgh Plate Glass).

March 6, 1953—"Butyl Rubber Polymerization" by Dr. John Rehner, Jr. (Esso Laboratories).

April 10, 1953—"Applications of Magnetochemistry to Polymers and Polymerization" by Professor P. W. Selwood (Northwestern University).

Dr. James F. Bonner of the California Institute of Technology will also deliver a lecture on "The Synthesis of Rubber by Plants" on a date to be announced.

40th Carbon Black Anniversary

To commemorate the 40th Anniversary of the use of carbon black as a reinforcing agent for rubber, Binney & Smith Co. tendered a dinner to a group of rubber company executives and Columbian Carbon Co. officers at the Portage Country Club in Akron on the evening of July 22. Presiding for the hosts were A. F. Kitchel, president, and J. M. Hamilton, vice-president, of Binney & Smith Co., and representing Columbian Carbon Co. were C. E. Kayser, president, and L. L. Shepard, treasurer. In 1912 when the reinforcing properties of carbon black were first applied to rubber tires, it was Mr. Kitchel who made the initial visits to Akron, making arrangements for Binney & Smith to supply the B. F. Goodrich Co. with the pioneer shipments of carbon black. This marked the beginning of a spectacular rise in tire mileage and cleared the way for the present high-speed automobile era.

Akron Section Elects Officers

The Akron Section of the American Chemical Society has elected the following officers for the 1952-53 season: *Chairman*, J. D. D'Ianni (Goodyear); *Chairman-Elect*, W. G. Mayes (Firestone); *Secretary*, T. L. Gresham (Goodrich); *Treasurer*, J. T. Gregory (Goodrich). G. H. Stempel, Jr. (General), 1951 chairman, was elected councilor, and S. T. Semegen (Goodrich), alternate councilor.

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NAMES IN THE NEWS

MAX F. MOYER, manager of cycle tire sales for the Goodyear Tire & Rubber Co., has returned to his position at the company following a tour of duty at the Air Command and Staff School of the U. S. Air Force.

ROBERT K. MUELLER has been appointed general manager of the Plastics Division of the Monsanto Chemical Co., Springfield, Mass., succeeding the late F. A. ABBIATI.

JOHN F. SNEDEKER, purchasing agent for the Binney & Smith Co., has been elected president of the Purchasing Agents Association of New York.

E. H. MACNIECE, director of quality control for Johnson & Johnson, has been named chairman of the new Industry-University Committee for Quality Control at Rutgers University.

THEODORE C. KIESEL, active in the pigment field since 1924, has been appointed exclusive agent of Godfrey L. Cabot, Inc., for the sale of Cabot carbon blacks to the paint, ink, plastics and related industries in Southern and Central Ohio, Southern Indiana, and Northern Kentucky.

C. A. LITZLER, president of Industrial Ovens, Inc., left the United States on August 20 for a two-month tour of Europe in order to discuss tire cord processing systems with leading manufacturers there.

DONALD N. SUKOW, formerly associated with the Technical Department of the Goodyear Synthetic Rubber Corp. in Akron, Ohio, has been named chief chemist of the Kentucky Synthetic Rubber Corp.

ALFRED H. LINCOLN, formerly associated with the Tillotson Rubber Co., has joined the Granet Corporation, Framingham, Mass., as chief chemist.

ALFRED G. RAUFER, formerly eastern sales manager for the Michigan Chemical Corp., Saint Louis, Mich., was recently appointed sales director of the company.

B. L. HATHORNE, formerly associated with the Geigy Co., has joined the staff of the Glyco Products Co. as assistant to the vice-president in charge of development.

EDWARD LEBO, previously assistant director of public relations for the U. S. Rubber Co., has been named public relations director of Hewitt-Robins Inc. with headquarters in Stamford, Conn.

LESTER J. HYLAND has been appointed sales manager of the Industrial Rubber Division of the Thermoid Co., Trenton, N. J.

FRANK J. MCCORMACK, associated with the Federal Leather Corp., Belleville, N. J., since January, 1950, has been appointed sales manager in charge of furniture sales for the company.

C. J. MCCRORY, formerly manager of farm tire sales for the Firestone Tire & Rubber Co., has been named manager of truck tire sales succeeding the late GEORGE M. JENKINS. C. R. MILLER, previously national account and government sales manager, has been named manager of farm tire sales succeeding Mr. McCrory.

CLAUDIUS P. TURNER, former owner of the Pacific Tire & Rubber Co., has been sentenced to one year in prison for passing worthless checks.

CLAUDE J. GUNTHER, formerly a sales representative in the New York district for the Seiberling Rubber Co., has been named manager of the Mileage Sales Department succeeding A. WADE SCHWAB, who has resigned. RALPH K. FERGUSON, associated with the company since 1939, has been named service supervisor of mileage accounts.

DUDLEY G. BROWNING, JR., secretary-treasurer of the Intercontinental Rubber Co., has volunteered to serve as chairman of the Rubber and Plastics Group in the 1952 Sister Elizabeth Kenny Fund Appeal.

HARRY W. HILLMAN, associated with the Goodyear Tire & Rubber Co. since 1934, has been elected controller of the company succeeding CHARLES H. BROOK, who has retired after thirty-one years' service with the company.

JOHN S. LOWRY, formerly general foreman of the Mat Division, Seiberling Rubber Co., has been appointed factory manager of Ace Rubber Products, Inc., Akron, Ohio.

WALLACE L. HOWE, previously director of research and development for the Norton Co., Worcester, Mass., has been named head of the company's research and development laboratories succeeding MILTON F. BEECHER, who recently retired as a vice-president and a director of the company.

L. F. HICKERNELL, chief engineer of the Anaconda Wire & Cable Co., has been elected chairman of the newly-formed Committee on Technical Operations of the American Institute of Electrical Engineers.

ELMER F. MYERS, associated with the Farrel-Birmingham Co. since 1936, has been named to handle the sale of the company's machinery in Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Florida and Alabama.

Named Assistant Sales Manager

John Crowther

JOHN CROWTHER, associated with the Stauffer Chemical Co. for the past 7 years, has been named assistant sales manager of the company. He was formerly director of Eastern Division Research, with offices at Chauncy, N. Y. Before joining Stauffer Chemical, Mr. Crowther was a Major in the U. S. Air Force. Prior to the war, he was associated with the M. W. Kellogg Co. A chemical engineer, Mr. Crowther is a member of the American Institute of Chemical Engineers, the Commercial Chemical Development Association and the Chemists' Club.

JOHN G. HARRISON, formerly chief chemist of the Trenton Division of National Automotive Fibres, Inc., and before that associated with the Firestone Tire & Rubber Co., has joined the Imperial Chemical & Plastics Corp., Cranston, R. I., as director of research and development.

GEORGE E. TUBB, formerly general sales manager of the Lord Manufacturing Co., Erie, Penna., was recently elected vice-president in charge of sales.

FRANK J. KIERNAN, who has specialized in the field of organic and fine chemicals for a number of years, has been appointed a sales engineer for the U. S. Stoneware Co. with headquarters in the company's office in New York, N. Y.

LOUIS M. BROWN, formerly executive vice-president of the Eberhard Faber Pencil Co., New York, N. Y., has been elected president of the company succeeding THOMAS R. RUDEL, who has resigned as president and chairman of the board. Mr. Rudel continues as a director of the company.

AUSTIN GOODYEAR, general manager of both the Rubber Division and the Conveyors Division of Hewitt-Robins, Inc., has been elected a director of the company.

DONALD H. WALKER, associated with the Goodyear Tire & Rubber Co. since 1933, has been named assistant treasurer of the company succeeding HARRY W. HILLMAN, who was recently elevated to comptroller.

FINANCIAL NEWS

B. F. Goodrich Co.

First Half: Net income of $14,905,791, which is equal to $3.46 a share after a reserve of $1,000,000 for increased replacement cost of facilities. Compared with $16,176,202, or $3.79 a share, after a reserve of $2,000,000 for increased replacement cost of facilities. Net sales of the company in the first six months of 1952 totaled $297,278,822, 7.7% lower than the $322,175,790 in the first six months of the preceding year. Net working capital increased from $182,421,536 to $197,031,239 during the period from June 30, 1951 to June 30, 1952.

Dewey & Almy Chemical Co.

First Half: Net loss of $44,473, after provision for a tax carry-back, on net sales of $12,493,443, for the first six months of 1952. In the first six months of 1951, earnings were $797,746 on sales of $15,069,357. This year's first half loss, before the tax carry-back, was $649,473.

Minnesota Mining & Mfg. Co.

First Half: Net income of $7,486,720, which is equal to 91c a share, compared with $7,951,939, or $1.00 a share in the first half of the preceding year. Net sales in the first half of 1952 totaled $88,074,407, against $85,850,163 in the six months ended June 30, 1951.

Columbian Carbon Co.

First Half: Net income of $2,127,847, which is equal to $1.32 a share, contrasted with $2,823,275, or $1.75 a share, for the corresponding period of 1951. Sales in the first half of 1952 were $22,988,609, against $25,802,103 in the first six months of the previous year.

Aetna-Standard Engineering Co.

Year Ended June 30: Net profit of $774,285 on net sales of $20,520,386, compared with $829,987 on sales of $9,575,183 in the previous fiscal year. Unfilled orders exceed $42,000,000 with government business amounting to approximately 30% of the total.

Mansfield Tire & Rubber Co.

First Half: Net profit of $591,321, which is equal to $1.07 a share, compared with $1,588,082, or $9.77 a share, in the first half of the previous year. Sales in the first half of 1952 totaled $25,737,237, against $33,946,000 in the first half of 1951.

New Jersey Zinc Co.

First Half: Net profit of $5,250,473, which is equal to $2.68 per share, compared with $5,129,894, or $2.62 a share, in the first half of the preceding year.

Goodyear Tire & Rubber Co.

First Half: Net profit of $15,480,369, which is equal to $3.39 a share, compared with $20,685,820, or $4.66 a share, in the first half of the previous year. Net sales in the first half of 1952 totaled $568,833,355, against $544,642,341 for the first half of 1951. Working capital as of June 30, 1952, amounted to $390,228,000 and the ratio of current assets to current liabilities was 5 to 1, the same as a year ago.

United Engineering & Foundry Co.

First Half: Net income of $1,933,587, which is equal to 77c a common share, contrasted with $1,933,944, or 77c a share, in the first half of the preceding year. Net sales in the six months ended June 30, 1952, totaled $42,544,934, against $29,363,816 in the six months ended June 30, 1951.

Plymouth Rubber Co.

Six Months Ended May 31: Net loss of $394,654 after taxes and other charges compared with a net profit of $531,010, or 59c per share, in the six months ended May 31, 1951. Sales in the 1952 fiscal period were $6,979,654, against $9,695,667 in the six months ending May 31, 1951.

National Rubber Machinery Co.

First Half: Net profit of $285,134, which is equal to $1.62 a share, compared with $238,645, or $1.55 a share, in the first half of the previous year. Sales in the first half of 1952 totaled $9,236,967, against $3,905,000 in the first half of 1951.

General Tire & Rubber Co.

Six Months Ended May 31: Net profit of $2,946,246, compared with $3,411,779 in the six months ended May 31, 1951. Sales for the 1952 period amounted to $87,657,490, nearly a 4% increase over the corresponding period of the previous year.

Belden Manufacturing Co.

First Half: Net income of $441,902, which is equal to $1.37 a share, compared with $620,982, or $1.93 a share, in the first half of the preceding year.

Anaconda Wire & Cable Co.

First Half: Net profit of $3,092,344, which is equal to $3.66 a share, compared with $3,120,776, or $3.70 a share, in the first half of the preceding year.

United Carbon Co.

First Half: Net income of $1,749,355, which is equal to $2.20 a share, compared with $1,829,724, or $2.30 a share, in the first half of the preceding year.

Electric Auto-Lite Co.

First Half: Net profit of $5,009,705, which is equal to $3.35 a share, compared with $5,334,133, or $3.57 a share, in the first six months of the previous year. Sale for the six months ended June 30, 1952 totaled $132,486,594, down 15% from the record volume of $155,916,022 in the first half of 1951.

Hewitt-Robins Inc.

First Half: Net profit of $466,317, which is equal to $1.63 a share on net sales of $19,122,369, compared with $633,844, or $2.27 a share, on sales of $18,066,678 in the first half of the previous year.

Cooper Tire & Rubber Co.

First Half: Net income of $164,150, which is equal to $1.05 a share on net sales of $7,854,247, compared with $142,866, or 91c a share on sales of $9,941,958 in the first half of 1951.

U.S. Rubber Reclaiming Co.

Twenty-Four Weeks to June 15: Net income of $100,943, after tax charges of $120,800, compared with $257,111, after $532,600 in taxes in the corresponding period of the previous year.

Rome Cable Corp.

Quarter Ended June 30: Net profit of $562,925, which is equal to $1.15 a share, compared with $489,043, or $1.05 a common share in the corresponding quarter of the preceding year.

Brown Rubber Co.

Six Months Ended June 28: Net profit of $453,421, which is equal to $1.20 a share, compared with $652,134, or $1.73 a share, in the corresponding period of the previous year.

Interchemical Corp.

First Half: Net profit of $1,020,662, which is equal to $1.28 a common share on net sales of $43,419,676, compared with $1,571,353, or $2.11 a share on sales of $46,607,101 in the first six months of 1951.

Baldwin Rubber Co.

Year Ended June 30: Net profit of $902,697, which is equal to $2.29 a share, compared with $1,224,327, or $3.11 a share in the previous fiscal year.

General Cable Corp.

First Half: Net income of $2,469,954, which is equal to $1.10 a common share, contrasted with $2,693,789, or $1.21 a share in the first half of 1951.

Garlock Packing Company

First Half: Net income of $630,780, which is equal to $1.50 a share, contrasted with $950,982, or $2.27 a share, in the first half of the preceding year.

Intercontinental Rubber Co.

First Half: Net income of $68,610, compared with $125,674 in the first half of the preceding year.

General Tire Pooling Arrangement

A new type of production pooling arrangement that enables small business firms to band together to share in defense contracts has been disclosed by the General Tire & Rubber Co. First of its kind, the unique program has the approval of the Attorney General, the Federal Trade Commission and the Small Defense Plants Administration. General Tire Production Pool, Inc., has been organized to direct these activities. Under this "mother hen" type of holding company, General Tire both sponsors and finances the pool. As sponsor it will solicit defense contracts, assume liability for fulfillment of orders and provide sales, design and development engineering services and offer accounting and legal assistance. General Tire will not do any manufacturing under the terms of the agreement. Production facilities will be provided by small industries in surrounding areas. Actually, the tire company will take the role of any large manufacturer sub-contracting to other firms. In addition to General Tire, charter members are McCaskey Register Co., Alliance, Ohio; Ectro, Inc., Delaware, Ohio; Sterling Manufacturing Co., Cleveland, Ohio; and the Electronic & Manufacturing Co., Akron, Ohio. It is expected that about 25 companies will become members of the production team. General Tire Production, as a non-profit organization, will declare no dividends. Members will benefit by the actual work each performs. General Tire will be permitted a fee for its sales and management services. Activities of the pool will be confined to the defense program.

Lovell Installs Fink Cutters

Lovell Manufacturing Co., Erie, Penna., has installed a new unique roll cutting machine designed and built by F. J. Fink & Co., Cleveland, Ohio. Measuring 36 feet long and mounting 19 electric motors operating individual cutting heads, the machine is part of a $100,000 installation designed and produced by the Fink company. Heart of the unit is its 19 "Wink" cutters, consisting of pairs of razor-sharp blades which revolve together simultaneously to cut 24-foot lengths of rubber into wringer size. Nineteen cuts make 18 wringer rolls in one-thirtieth of a second. The stock is fed in automatically, while the finished pieces are also carried away automatically. The method replaces the conventional technique in which the tubes of rubber are sliced by a single cutter.

Goddeyne Rubber-Tired Casters

A new series of rubber-tired casters, ranging in wheel size from 6 to 16 inches, has been announced by the Goddeyne Wheel Products Co. of Bay City, Mich. Goddeyne recently purchased the Wheel Products Division of the Kayel Machine & Tool Co., and is now manufacturing and distributing a complete line of wheels and casters under its own name. Available in both swivel and rigid types, the new casters are of welded construction throughout, and the wheels are equipped with semi-pneumatic or solid rubber tires as required by load and service conditions.

FRI Opens New Paris Building

On June 27th, the French Rubber Institute opened its new building, the third addition to its present facilities at 42 Rue Scheffer in Paris. The new building includes a large rubber library, said to be the most complete in France, and new laboratories equipped with the latest machines and equipment. Operations of the Institute are centered within three depart-

Shown above is the newly-opened building of the French Rubber Institute in Paris.

ments—documentation, research and the monthly publication, *Revue Général du Caoutchouc*. With its new facilities, FRI is now equipped to handle all problems relative to natural rubber production and use. Various high officials of the French, Viet Nam and Cambodia governments attended the opening of the new building. FRI was founded in 1936 by the rubber growers of French Indo-China.

Vinyl Flooring Institute Formed

The Vinyl Flooring Institute has been formed at 101 Park Avenue, New York 17, N. Y., with a view to advancing the interests of the industry, it was announced after a recent organizational meeting in Chicago, Ill. Representatives of manufacturers taking part in the meeting included T. L. Shaffer of Congoleum-Nairn, Inc.; Winthrop Brown, Jr., of the B. F. Goodrich Co.; H. A. Hachmeister of Hachmeister, Inc.; J. P. Stiger, E. K. Clark and L. R. Hoff of the Johns-Manville Corp.; C. A. Neumann and H. C. Hachmeister of the Mastic Tile Corp. of America; H. A. Glatte and F. H. Neher of the Tile-Tex Division of the Flintkote Co.; and J. O. Heppeps of the Uvalde Rock Asphalt Co. Mr. Stiger was appointed chairman of a committee to draft a constitution and by-laws.

WASHINGTON APPOINTMENTS

Richard A. McDonald, formerly assistant administrator in charge of the Industrial and Agricultural Equipment Bureau of the National Production Authority, has been named deputy administrator of NPA succeeding F. T. Stone.

NPA Cites Narragansett Wire

The National Production Authority has filed charges against the Narragansett Wire Co. of Pawtucket, R. I., and an alleged dummy corporation in Dallas, Texas, with 52 separate violation counts. NPA charged that the Dallas firm, the Texas Wire & Cable Co., "a purportedly independent corporation, was in fact organized and financed to the extent of $100,000 by the Narragansett Wire Co. as a device by which the latter company obtained copper." Although the Texas firm applied for allocations to make wire, NPA said, "no plant facilities existed in Dallas and no production workers were employed there."

The 52-count complaint against the companies charged them with misrepresenting their purchases, receipts, inventories and shipments of copper and copper products. They also were alleged to have failed to provide accurate information with regard to their manufacturing operations, their facilities and the number of their employees.

NPA will urge at a compliance hearing that all priority aid, allocations and other government assistance be deprived the companies and that they be prohibited from obtaining and using any materials under NPA control "for the duration of the Defense Production Act."

Fisher Laboratory Planning Kit

Fisher Scientific Co., Pittsburgh, Penna., has announced a new laboratory planning kit which permits custom installations of entire laboratory rooms without blueprints or conferences. The unique kit contains scaled cut-outs, representing 21 ready-made, pre-engineered steel furniture units. The cut-outs can be manipulated on the kit's graph paper. Heights of assemblies can be allowed for just as easily as floor areas by means of the kit's booklet, which gives front and side-view dimensional drawings. Finally, even laboratory utilities (gas, electricity, water, cup sinks) can be marked on the plan and ordered as part of the ready-made furniture line. Included with the kit is a complete catalog of furniture and photographs of suggested laboratory installations. The kit is packaged in a sturdy folder and is available upon request to the company.

Starts Monoglyceride Production

Glyco Products Co., Inc., Brooklyn, New York, has begun partial manufacturing operations at its new plant in Williamsport, Penna., about a month ahead of schedule. The first products going into large-scale production are the edible monoglycerides for use in rubber and plastics as well as in candy, chewing gum, etc. The new plant has about 150,000 square feet of floor space and thirty acres of land. It is served by four railroad sidings. All civilian production will be gradually transferred from the company's plant at Natrium, West Va., to the plant at Williamsport. Present plans call for the Natrium plant to concentrate on the production of special chemicals for the defense program.

Naugatuck Promotes Wesley Coe

Dr. Wesley S. Coe

Dr. Wesley S. Coe, associated with the U. S. Rubber Co. since 1936, has been named assistant factory manager of the Naugatuck, Conn., plant of the company's Naugatuck Chemical Division. Dr. Coe joined the company at its general laboratories in Passaic, N. J., in 1936 after receiving his doctor's degree in chemistry at the University of Illinois. He transferred to Naugatuck Chemical in 1937 and served in the research and development department as senior section leader in process development. Immediately prior to his new appointment, he was chemical production superintendent and assistant to the factory manager. Herbert Scullin has been named to succeed Dr. Coe as chemical production superintendent. Mr. Scullin joined Naugatuck Chemical in 1935. He served successively as foreman, general foreman, assistant superintendent in the chemical production department and labor relations supervisor in the industrial relations department.

Plans Rubber Technology Course

A two-year course in fundamental rubber technology is being inaugurated at the Illinois Institute of Technology with the cooperation of the Education Committee of the Chicago Rubber Group. This course will be designed for the non-trained factory personnel and new-comers in the rubber field. The details of this course are being worked out by the Education Committee and Professor C. W. Selheimer of the Institute. The course will be offered in the evening school of the Chemical Engineering Department of the Institute at dates to be announced later. The tentative program calls for a course in elementary chemistry in the first semester designed to acquaint the student with the chemistry of rubber and the materials used in its formulation. Other lectures will cover mathematics as applied to measurements and calculations in the rubber industry. The second semester will have to do with elementary physics and operations in the rubber factory. The second year will include a seminar on rubber technology, elementary compounding and problems in compound design.

News in Brief

"Latex-O-Crete," a new flooring composed of special aggregates and synthetic rubber emulsions, is now being produced by United Laboratories, Inc., Cleveland, Ohio.

Witco Chemical Co. has installed three new stills, two of 100-ton and one of 50-ton capacity, for making roofing and paving asphalt at the company's Perth Amboy, N. J., plant.

Vinyl plastic pipe made from Geon resin and extruded by the Prima Pipe Co. of Scottsbluff, Nebraska, has been installed in an underground irrigation system at the Scottsbluff Country Club.

A patented all-plastic slide fastener without teeth called "Flexigrip" is being introduced by Flexigrip, Inc., New York City. The slide is specifically designed for use with plastic film or sheeting.

The Electrical Wire and Cable Department of U. S. Rubber has published a new, 180-page general catalog of its line of more than 500 different types of wires and cables.

Industrial Products Co., Philadelphia, Penna., is producing a new flexible valve shield made of neoprene rubber for use on valves handling acids and other hazardous chemicals.

Frankford Arsenal, Philadelphia, Penna., has awarded one of the largest single contracts yet placed for environmental test equipment. Totaling nearly $500,000, the contract calls for a cold room, an anteroom for the cold room, a humidity chamber and an arid desert room.

A new rubber suction hose, developed by Goodrich, is being used in the handling of sardines from net to ship and from ship to cannery dock.

Production of foam rubber seat cushions for the automobile industry recently hit the 5,000,000 mark at the Buffalo, N. Y., plant of Hewitt-Robins Inc.

Arthur D. Little, Inc., has opened a new mid-west office in the Railway Exchange Building, Room 2074, St. Louis 1, Mo.

Special oil-resistant Hycar seals have been developed by the National Motor Bearing Co., Inc., Redwood City, Calif., to prevent dangerous oil leakage from aircraft propellor oil control assemblies.

"Natural Rubber and GR-S Compounds Having Excellent Low Temperature Flexibility Utilizing Thiokol TP-90B", is the title of Technical Service Bulletin No. 110, made available by the Thiokol Corp., Trenton, N. J.

A toilet seat, padded with foam rubber and covered with Duran, has been introduced by the National Sanitary Products Corp., Ridgefield, N. J.

Shepard Appointed Sales Director

Whiting N. Shepard

Whiting N. Shepard, associated with the Boston Woven Hose and Rubber Co., Cambridge, Mass., since February of this year, has been named director of sales for the company. Until his promotion, Mr. Shepard was head of plastics sales for the company. In his new capacity, he has the responsibility for all marketing activities of the company. Mr. Shepard was formerly associated with the Plaskon Division of the Libbey-Owens-Ford Glass Co. With that firm for 19 years, he was instrumental during the 1930's in the introduction and market development of urea plastics. Later, he carried out the market introduction of urea glues. A graduate of Williams College, class of 1932, Mr. Shepard is a member of the Society of the Plastics Industry and of the Society of Automotive Engineers.

Increasing Vibrin Facilities

Naugatuck Chemical Division, U. S. Rubber Co., is doubling the capacity of its facilities for the production of Vibrin polyester resins at its headquarters plant in Naugatuck, Conn. Demands for Vibrin resin as a structural material in combination with glass fiber have increased steadily during the past 12 months, the company said. Areas of greatest expansion have been shown in the use of the material for the manufacture of chemical-resistant pipe, translucent and transparent sheet construction materials, machine housings, materials handling equipment, radomes and other plastic parts for the aircraft industry, boats and plastic auto bodies in the sports car field. Naugatuck Chemical now manufactures 10 different types of polyester resins for the reinforced plastics fabricator which include water white, heat resistant, fire resistant, flexible, hard, casting, and ultra-high heat resistant varieties. It recently announced a new general purpose resin known as Vibrin 117, which is light in color, has a low exotherm, cures uniformly and gives good translucency with glass fibers. It can be used in matched metal die molding, laminating and potting processes.

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Named General Purchasing Agent

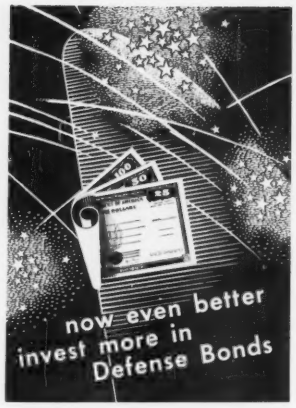
Donald A. Keppler, formerly assistant general purchasing agent for the General Tire & Rubber Co., has been appointed general purchasing agent succeeding the late Robert M. Graham. A graduate of the University of Akron, Mr. Keppler joined General Tire in 1929. He moved to the Purchasing Department in 1939 after managing the Printing Department for 10 years. He was made a purchasing agent in 1944. Mr. Keppler served as president of the Purchasing Agents Association of Akron in 1948. During World War II, he assisted the late Mr. Graham on the government's rubber-buying committee. General Tire has also announced the appointment of Chester J. Zabik as purchasing agent for rubber and all tire fabrics, while Emil F. Schnedarek has been named purchasing agent for all engineering projects and services. Mr. Zabik has been associated with General Tire for more than 20 years. He was appointed to the Purchasing Department in 1937. During World War II he was director of priorities for General Tire and also assisted Mr. Graham in rubber and tire fabric purchasing. Mr. Schnedarek, with General Tire since 1929, was formerly manager of engineering purchasing. He came to the company as a draftsman. In 1936, Mr. Schnedarek went to Poland as project engineer to General Tire's affiliate, the Stomil Rubber Co. He has also served as project engineer for the company's new plants in Venezuela and Waco, Texas. He joined the Purchasing Department in 1946.

Infrared Spectra Catalog

A comprehensive punch-card catalog of all available data on the infrared spectra of organic and inorganic compounds is being set up by the National Bureau of Standards under the sponsorship of the National Research Council. The card catalog not only fills the pressing need for a general reference library of infrared spectra, but also provides a survey of the literature on each compound and abstracts of the literature covered. The task of compilation is now well under way, and the first of the punch cards containing spectra, bibliographic information, and other useful data on 45 compounds are being made available to industrial and research laboratories.

Issuing Data on Rubber

Latex and Rubber, Inc., 1075 Hull St., Baltimore 30, Maryland, recently mailed the first of a series of letters on dry rubber to the trade under the general term of "Tiger Talk." These letters are intended to bring scientific and technical data on quality, properties, testing procedures and packing to the attention of the industry and possibly provide a forum for the frank exchange of ideas of mutual advantage to seller and consumer. The first issue of "Tiger Talk" is devoted to such subjects as curing characteristics of rubber, ozone, T. C. rubber, and the interpretation of T. C. marks. Copies of the letters can be secured from the company on request.



Rubber Pigment Calcene NC

"Calcene NC," the latest addition to its family of white reinforcing pigments, has been announced by the Columbia-Southern Chemical Corp., Pittsburgh, Penna. The product is a non-coated, fine-particle precipitated calcium carbonate that imparts superior whiteness to white or light colored molded goods, the company claims. It is similar in physical and chemical properties to Calcene TM, except that it is non-coated. Calcene NC disperses easily under normal mixing procedures and shows no variation when masterbatching techniques are employed. The company states that in some cases it may be possible by using Calcene NC to eliminate the masterbatching step without sacrificing results.

Harwick Introduces Fairport Flock

Harwick Standard Chemical Co., Akron, Ohio, has introduced "Fairport Flock," which is offered as a low cost, low gravity compounding ingredient. The company itemizes its specifications as follows: Appearance—gray powdery flock; Specific Gravity—1.58 true gravity and 1.31 gravity by difference in rubber; Fiber length—all through a 60 mesh screen and 70% through a 100 mesh screen; Moisture content—4% maximum; Acetone extract, 1% maximum. Modulus and Shore hardness are said to be raised very rapidly by incorporating low volumes of Fairport Flock. Fairport Flock is cellulose and easily dispersed in rubber. It is available in multiwall 50 pound paper bags.

Cold Polymerized Hycar 1042

B. F. Goodrich Chemical Co., Cleveland, Ohio, is now making use of the low temperature polymerization process in the manufacture of Hycar 1042. This is the first time a privately-owned plant has produced a "cold" rubber. Hycar 1042 is said to provide the compounder with significant improvement in tensile and elongation at no increase in polymer or compound cost. The outstanding oil resistance, heat resistance and compression set characteristics typical of the Hycar nitrile-type rubbers are maintained or improved in this new cold rubber.

Rubber Road Research Program

The University of Kentucky has been awarded a contract for a rubber road research project. Financed by the Firestone Tire & Rubber Co., the research work is being carried on by the Engineering Experiment Station of the College of Engineering at the University. Preliminary work was begun last year and the contract has been extended four times. At the university, rubberized paving materials are subjected to a series of tests. In one step, the bituminous mixtures are aged in an aging chamber. Samples are also placed in a fatigue tester designed by the College of Engineering. This device is installed in a refrigerating unit and test paving blocks, at varying temperatures, are put in motion under stress to simulate the pounding of traffic. The Firestone project is one of a number of contracts presently being administered by the Kentucky Research Foundation, a corporation organized in 1945 to further research, public service, and scholarship at the university. Grants received from industry and government for research of various kinds so far have totaled more than a third of a million dollars.

"Silastic Facts" Revised

Dow Corning Corp., Midland, Mich., has announced a complete revision of "Silastic Facts No. 10," its comprehensive review of the properties and performance of Dow Corning silicone rubber. "Silastic Facts No. 10a," presents the latest information on the subject. The new edition provides a detailed discussion of the characteristics of these semi-organic elastomers, devoting separate sections on their resistance to high and low temperatures, to weathering, chemicals and hot oils, to compression set and thermal aging, and to their dielectric properties. A chart summarizes the physical characteristics of 22 leading stocks. Typical applications, including gaskets, seals, mechanical parts, hoses and dielectrics are also described and illustrated.

Protox-169 Zinc Oxide

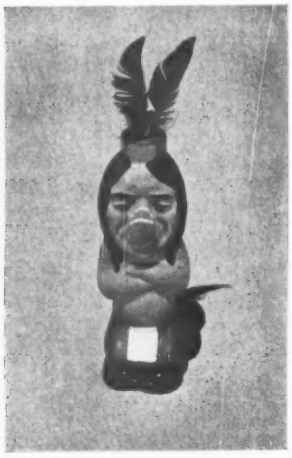
New Jersey Zinc Co., New York, N. Y., has announced "Protox-169," a new, fine-particle zinc oxide which has been surface-treated with propionic acid. Protox-169, prepared by surface-treating "Kadox-15" with propionic acid, provides a surface area of about 10 square meters per gram, the company states. Other zinc oxides range in surface area from 3.5 to 8 square meters per gram. The new product has the unique coating of zinc propionate that is readily wetted by both natural and synthetic rubber. This coating is said to impart fast incorporation and smooth tubing and calendering. With outstanding dispersion characteristics, the company claims that this new product will give maximum efficiency of activation and reinforcement.

Collector rings for brake motors are now being molded from G-E rubber-phenolic compounds by the Rockford Molded Products Co., Rockford, Ill.

LEADING SUPPLIERS TO THE RUBBER, PLASTICS AND ALLIED INDUSTRIES ·

Bayshore Chief Blo-Your-Top

Bayshore Industries, Elkton, Md., has introduced a new rubber toy which, while primarily designed for children, has considerable appeal for adults. The unique



feature of the toy is a feathered cork which is inserted into the top of the toy's head. When "Chief Blo-Your-Top" is squeezed, the cork is vigorously expelled. The product is attractively colored.

Hycar Latex Newsletter Issued

Favorable reaction to the publication of the "Hycar Technical Newsletter" has led the B. F. Goodrich Chemical Co., Cleveland, Ohio, to begin publication of a "Hycar Latex Newsletter." This new publication will provide basic information on standard latices and new latices. Specific data on thickening agents, stabilizers, accelerators, pigmentation and physical properties will also be made available. The newsletter will also present information on new applications such as paper saturation, resin modification, leather finishing and textile treatment. Issue No. 1 of the newsletter is accompanied by Service Bulletin H-9: Hycar Latices. This bulletin presents information on standard Hycar latices, their properties, their methods of handling and several current applications.

Waldron Joins McCreary Tire

L. J. Waldron, formerly chairman of the Review Board of the Rubber Division, National Production Authority, has joined the McCreary Tire & Rubber Co. of Indiana, Penna., as assistant to the president. Mr. Waldron was previously associated with the Pennsylvania Rubber Co. as general sales manager. He was also sales manager of the Special Brand Division of the Dayton Rubber Co. A graduate of Dartmouth and a veteran Air Force pilot of World War I, Mr. Waldron served as a senior consultant to the rubber director during World War II. When the Korean conflict began he was called to act as chairman of the Review Board of NPA's Rubber Division.

LABOR NOTES

A new uniform wage agreement covering approximately 16,000 production and maintenance workers in nine plants of the B. F. Goodrich Co. was signed by representatives of the company and the United Rubber Workers, CIO, on August 27. The agreement ended negotiations which started June 9 and a strike called on August 18. The wage agreement provides for an increase of 10c an hour, effective August 27. Also included is a full union shop, liberalized minimum incentive guarantees, minimum vacation payments and improvements in service credit rules, as well as an improved company security-union responsibility provision aimed at materially reducing illegal work stoppages.

Firestone Local 7, URW, covering Akron workers, has turned down the overall contract agreement reached with the company a short time ago. The master agreement with the company still can be approved and put into effect by a majority vote in seven other Firestone locals, regardless of the Local 7 votes.

Anderson Rubber Co., Akron, Ohio, has agreed to rehire 80 employees it had fired for taking part in an unauthorized strike. Only the 80 fired for joining the strike will be taken back. Three discharges which touched off the walkout will stand under the company union agreement.

Representatives of the General Cable Corp. and the United Electrical Workers Union, independent, resumed negotiations recently in an effort to settle a strike against the Rome, N. Y., Los Angeles and Emeryville, Calif., plants. The strike was called about 3 months ago.

About 800 employees of the South Braintree, Mass., plant of the Armstrong Cork Co., affiliated with 2 AFL unions, walked out on August 25 after rejecting a 10c package offer made by the company. Negotiations between the Rubber Workers Federal Union and the International Brotherhood of Firemen, Oilers and Powerhouse Workers and Armstrong Cork, had been under way since last March 28.

United Rubber Workers, CIO, has been named bargaining agent for employees of the Fremont Rubber Co., Fremont, Ohio. Fremont Rubber employees voted 207 to 137 for URW over an AFL union in an NLRB election held on August 6.

Sun Rubber Promotes McDermott

Bernard A. McDermott, associated with the Sun Rubber Co., Barberton, Ohio, for the past 11 years, has been named assistant to the president of the company. In his new post, Mr. McDermott will serve as technical director of the firm. He will be in charge of process engineering and the laboratory as well as head art development and new products. A graduate of the Cleveland School of Art, Mr. McDermott also attended the Ceramics Engineering School of Alfred University, and studied art at the University of Akron and Kent State University.

Portable Golf Driving Range

Par Golf Co., 1015 Portage Street, North Canton, Ohio, is producing the "Masterpiece Golf Driving Range," a portable aid to golfers. The unit consists of a rubber mat to which is attached a soft, imitation, exact size, rubber golf ball,

The ball is attached to the mat by means of a strong rubber cord. A target is also furnished. Each foot that the target is placed from the ball represents 50 yards of real golf ball flight. Ideal for home golf practice the retractable ball eliminates chasing and prevents damage to furniture, etc.

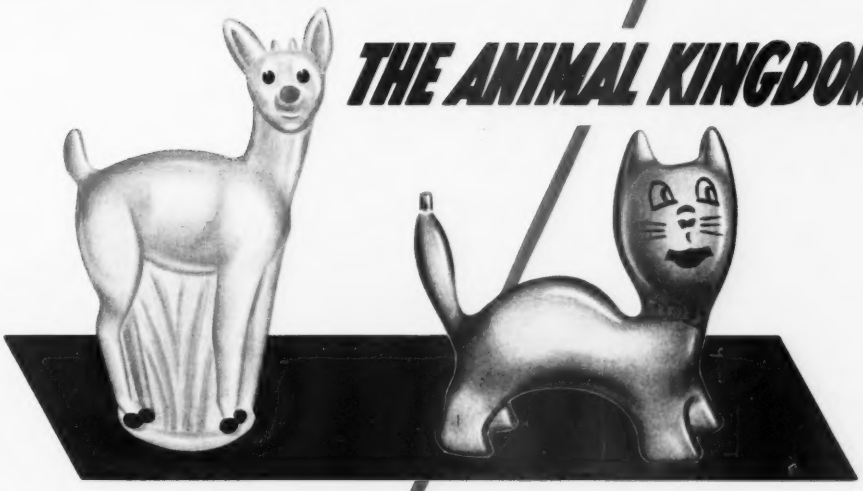
Firestone Announces Promotions

Promotion of William P. Bray, Jr., and E. Robert Zimmerman to new positions has been announced by the Firestone Tire & Rubber Co. Mr. Bray, formerly operating assistant to J. E. Trainer, vice-president in charge of production, has been named chief expediter in the company's Purchasing Department. Mr. Zimmerman, previously in the Time Study Division, has succeeded Mr. Bray as Mr. Trainer's operating assistant. A native of Akron, Mr. Bray is a graduate of the University of Akron where he received his B. S. degree. He joined Firestone in 1939. Also a native of Akron, Mr. Zimmerman is a graduate of Oberlin College and Kent State University, majoring in business administration. He started work at Firestone as a mail boy in the Advertising Department while he was still in high school.

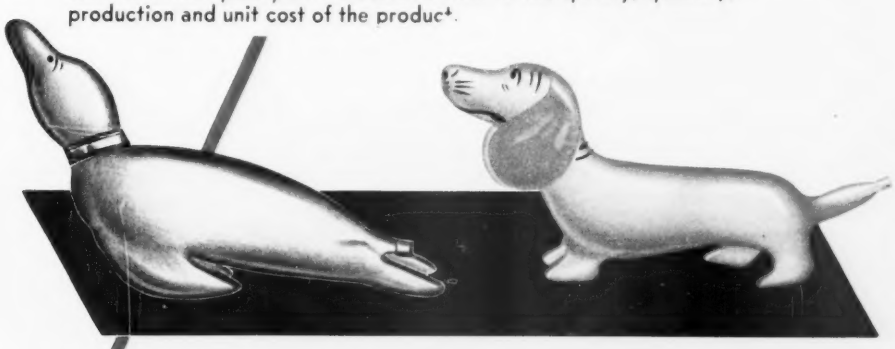
New Latex Emulsion Stabilizers

Recent tests conducted in the laboratories of the Armour Chemical Division of Armour & Co., Chicago 9, Ill., indicate that the company's Etho-chemicals are suitable stabilizers for latex emulsions. The company reports that the addition of as little as 0.25% Ethomeen C/15 to a butadiene-styrene type emulsion caused the mixture to remain liquid at 0° F. Good results were also obtained with Ethomeen S/12, Ethomeen S/15, Ethomeen S/20, Ethofat 60/15, and Ethofat C/15. Since the Ethomeens and other Armour Etho-chemicals are excellent emulsifiers, tests are being conducted to determine whether Ethomeen C/15 or one of the other materials can be used as an emulsifier, as well as a stabilizer, for latex emulsions.

THE ANIMAL KINGDOM



Whether it's Rudolph, Fifi the Cat, Flipper the Seal, or Fritz the Dachshund, or any other Cradle or Squeeze-Me Toys of the Animal Kingdom, all are created by the millions on Forms made by The Akron Presform Mold Company. Manufacturers of latex products know that the quality of the Form is vital to the quality, quantity, production and unit cost of the product.



Every manufacturer of latex products should be continually developing new products, improving production and working to create further business. When you come up with a new latex product, come to us for solid or hollow Forms. We offer complete service in designing, die-making, pressure-casting, machining and finishing.

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CANADIAN NEWS

Polymer Corp., Ltd., Sarnia, Ont., has reported sales totaling $45,895,465 for the fiscal year ended last March 31. Of this total, $36,634,466 came from sales of rubber, $6,916,693 from chemicals, $2,201,844 from utilities, and the rest was attributed to "other income". Net income equalled $8,575,786, 18% of gross income or 13% of the installed plant cost. This amount would have been reduced to approximately $3,950,000 if Polymer had been liable for payment of income tax. In fiscal 1951, sales were $35,796,764 and net income $4,108,363.

The company's financial structure was rearranged on April 1, 1951, transferring plant and other assets from the Crown to the company. Authorized capital stock was enlarged to 3,000,000 shares of no par value and 2,000,000 shares were issued. A funded debt of $8,000,000 in 4% serial debentures was assumed. This arrangement obligates the company to pay interest, dividends, and federal income tax.

Working capital of the company at the year-end was $12,384,000, a reduction of $4,620,000, which reflected a cash decrease of almost $3,000,000, a current liability increase of $5,700,000, and an inventory increase of over $4,000,000.

Polymer's recent expansion program, which increased capacity by 25% and cost over $10,000,000, enlarged facilities for feed preparation, styrene, copolymer and Butyl rubbers. Now under consideration are a sixth steam boiler, the new Girbitol unit for light hydrocarbon purification, facilities to diversify the copolymer unit further, and new research laboratories.

Polymer feels that the outstanding feature of its year was the development of commercial-scale processing techniques for oil-masterbatch rubbers marketed under the name "Krynol". The high butadiene feed rate to the copolymer area was made possible by commercial use of a new dehydrogenation catalyst developed by the Dow Chemical Co.

During the year, Polymer established production records in all phases of its operations. Ethylene production rose by 4,000,000 pounds to 40,800,000 pounds and styrene by almost 12,000,000 pounds to 69,400,000 pounds. Rubber production also hit new highs, Butyl reaching 34,300,000 pounds or 4,000,000 pounds more than the year before. Butadiene production hit 114,000,000 pounds, an increase of 12,400,000 pounds over the previous fiscal year.

The high sales revenue is attributed to the high prices which prevailed during most of the year for natural rubber. The margin between prices for natural and synthetic is now narrow but still favorable to synthetic. With the United States currently exporting very little synthetic rubber, almost no competition was met in the Canadian or European markets.

Any lowering of U. S. prices would have a strong impact on Polymer's sales position and any production beyond requirements in the U. S. would result in greater competition for the company in the world market.

Canadian Industries, Ltd., largest chemical company in Canada, told stockholders in a recent letter that it was still uncertain what plan would be proposed in view of the judgment of a United States District Court that Imperial Chemical Industries and E. I. du Pont de Nemours & Co., Inc. should end their joint ownership of controlling shares in the company. The company's letter outlined the four plans suggested by the court, including sale by either or both of the British and American companies of their shares to outsiders, sale of stock owned by one to the other, or segregation of Canadian Industries plants and properties so as to satisfy requirements of United States law.

ICI and DuPont must submit to the United States court their plan for remedial action within six months, extending from last July 30, date of the judgment. Appeal by either of the defendants to the Supreme Court is also a possibility, but the Canadian firm said it had no information as to whether the appeal action would be taken. If either ICI or DuPont proposes a physical division of the property, the directors of Canadian Industries will be consulted before the plan is submitted to the United States court.

Meanwhile, Canadian newspapers have attacked the United States order calling upon DuPont and ICI to end their joint ownership in CIL. Attacked particularly was that part of the order directing "segregation of physical division of the plants and properties of CIL between ICI and DuPont so as to create in Canada a situation in harmony with United States law."

The *Globe and Mail* of Toronto said that no United States institution, by any decree or order whatsoever, has the right to create any sort of situation in Canada, least of all one in harmony with United States law. The newspaper claimed that the U. S. court had not the slightest jurisdiction in Canada or over ICI, a British company.

An expansion program of approximately $450,000 for the Taylor Instrument Companies of Canada, Ltd., was recently announced. A new factory site in Toronto has been purchased and contracts let for the construction of a single story plant with an area of 40,000 square feet. The space will be utilized both as an office and for manufacturing the company's line of industrial, medical and household instruments. There are about 100 employees in the Canadian organization.

Taylor entered the Canadian market in 1914 with a sales representative. In the early 1920's it built its first manufacturing plant, and in 1930 was incorporated as a separate Canadian company. Since that date, gross sales have increased eight-fold.

D. B. Collett, vice-president and general manager of the Dunlop Tire & Rubber Goods Co., Ltd., Canada, has been appointed an executive director of the Dunlop Rubber Co., Ltd., England. Mr. Collett will continue as a member of the board of directors of the Canadian company. J. P. Anderson, formerly chief purchasing agent of the company in England, has been appointed vice-president and general manager to succeed Mr. Collett.

The Board of Control of Toronto has ordered a number of rubber "cones" which will be used to hold "slow" signs on streets near schools. The Board ordered a survey of the city to determine the number of cones required and approximate costs.

North American Cyanamid, Ltd., has consolidated its several office and warehouse locations in Montreal into one newly-constructed building. The new building will serve as headquarters for the Calco Chemical Division, the Industrial Chemicals Division, the Plastics and Resins Division and other American Cyanamid divisions. The office and manufacturing areas of the new building are completely air conditioned. It is a one floor, steel frame structure measuring 104,000 square feet, occupying a 10-acre plot at 5550 Royalmount Avenue in Montreal.

John Edward Hallonquist, former sales manager of the Tire Division of the Dunlop Tire & Rubber Goods Co., died recently at St. Joseph's Hospital in Toronto. For the past eight years he had his own business as a manufacturer's agent. Born in Winnipeg, he was appointed divisional manager for Dunlop in 1922. In March, 1950, he came to Toronto as sales manager of the Tire Division. He is survived by his wife.

Standards for Foam Mattresses

Foam rubber mattresses made according to a nationally recognized standard can now be purchased, according to the Commodity Standards Division of the U. S. Department of Commerce. The standards appear in a pamphlet recently offered for sale by the Superintendent of Documents. The purpose of this commercial standard is to provide a nationally recognized specification for the guidance of producers, distributors, and users of latex foam mattresses; to promote fair competition and consumer confidence in products conforming to this standard; and to provide a basis for labeling and guaranteeing the quality of the product. It covers minimum requirements and methods of testing for one grade of latex foam mattresses made of either natural or synthetic latex. Copies of the pamphlet, "Latex Foam Mattresses for Hospitals," Commercial Standard CS182-51, may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for 5c a copy.

Tired of waiting for this copy of RUBBER AGE to reach your desk? Use the coupon on page 831.

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3-210 An OUTSTANDING *Rubber Compounding Resin*

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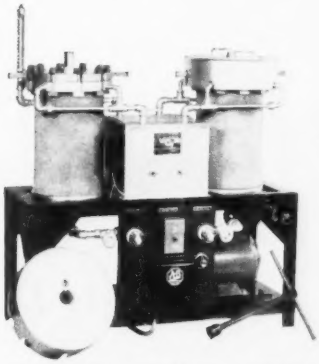
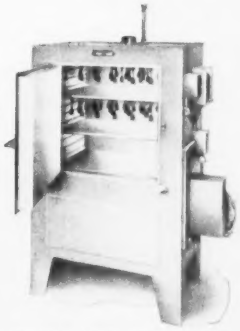
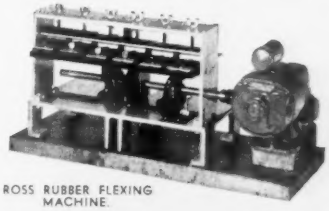


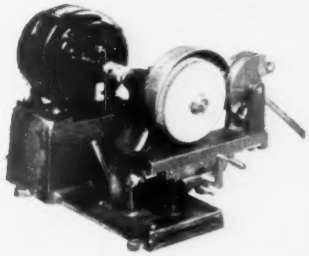
COMBINATION BIERER-DAVIS OXYGEN AGING AND AIR HEAT TEST OUTFIT. (Outfit shown with 2 bombs. Outfit with one bomb can also be supplied.)



EMERSON OVEN for Oven Aging of Rubber Samples A.S.T.M. D-571-48.



ROSS RUBBER FLEXING MACHINE.



RUBBER SAMPLE BUFFING MACHINE. (Shown with Rotary Platen).

EMERSON APPARATUS CO.
183 Tremont Street Melrose, Mass.

Sinclair Chemicals Formed

Sinclair Oil Corp. has announced the formation of Sinclair Chemicals, Inc., a direct subsidiary of the parent company, in a move to expand its operations further in the field of petrochemicals. The new organization will take over the production and sales of chemicals recoverable from petroleum raw materials, heretofore handled by the Petrochemical Division of the Sinclair Refining Co. Through this department, Sinclair has been actively promoting hydrocarbons, special solvents, chemical polymers, petroleum sulfonates and several chemical by-products of the refining process. The new subsidiary, of which P. C. Spencer, president of Sinclair Oil will also be president, will utilize the facilities of the Sinclair Research Laboratories, Inc., and will have its own research and market development staffs. John A. Scott, manager of the Petrochemical Division since its inception, will be executive vice-president of the new company. E. W. Isom, chairman of Sinclair Research Laboratories, Inc., and director of Sinclair research for more than 35 years, will be chairman of the new subsidiary which will maintain headquarters at 600 Fifth Avenue, New York, N. Y.

Seiberling Arranging Loan

Seiberling Rubber Co. has announced a plan to borrow $3,750,000 to increase working capital and permit sales growth. President J. P. Seiberling has told stockholders that the board plans to issue 15-year sinking fund debentures, convertible into common stock. The debentures would be sold through underwriters. The new borrowing will increase the company's funded debt by $2,550,000, Mr. Seiberling said, since a $1,200,000 insurance loan, now outstanding, will be retired. He said the additional working capital should "improve the company's financial strength, competitive position, and earnings." Shortage of capital has retarded sales growth, and created some inefficiencies, he added. Common stockholders will be asked to approve increasing the number of authorized shares, in order to provide stock for future debenture conversions, at a meeting called for on October 7. Holders of preferred shares must approve the added debt. The debentures will be offered soon after the October 7 meeting, if approvals are received, Mr. Seiberling said. Interest rates will be set at that time.

Schwab Rubber Buys New Building

Schwab Rubber Co. has purchased a seven-story building at 2347 Twelfth Avenue in New York City from the Reconstruction Finance Corporation and will occupy it in an expansion and consolidation move. Schwab Rubber is a major fabricator and distributor of foam rubber for cushions, mattresses, pillows, etc. The company, and its sales affiliates, the Schwab Latex Co., will occupy the building as offices, warehouse and for manufacturing purposes. The new facilities occupy a plot about 100 by 125 feet. The property has an assessed valution of $475,000.

LOS ANGELES NEWS

The Los Angeles Rubber Group, beginning with its October 7th meeting, will hold all future meetings at the Hotel Statler. Consistently increasing attendance at regular monthly meetings necessitated the change from the Hotel Mayfair where facilities were inadequate to the group's needs.

Bob Whitman, previously associated with research and development at the Dow Corning Co., has joined the Technical Sales Department of the company.

Ben A. Gruver, formerly vice-president and sales manager of Los Angeles Standard Rubber, Inc., has been elected executive vice-president and general manager of the company. Harvey H. Morrison, previously production manager, has been elected vice-president in charge of production, while R. G. McAdam has been named sales manager of the company.

TLARGI will hold its first fall golf tournament on September 26th at the Inglewood Country Club. Curt Wolter (California Rubber Products) is chairman of the tournament committee.

Formation of a new sales district for the West Coast has been announced by the Goodyear Tire & Rubber Co. Company officials said that the present Los Angeles district would be divided into two parts, the Los Angeles district and the new Southern California district. C. A. Crafts, present manager of the Los Angeles district, will continue in that capacity while B. J. Keenan, formerly assistant district manager in Baltimore, Md., has been named manager of the Southern California district. Both districts will be located in the newly-constructed office and warehouse building at 6666 Washington Blvd., near Vail Airport in Los Angeles.

W. C. Bryant, formerly in charge of the Tube and Air Bag Compounding Department at the Firestone Tire & Rubber Co., has been named production manager of the Los Angeles plant of the Xylos Rubber Co., succeeding R. L. Bowen, who has been transferred to the Fuel Cell Division of Firestone's Los Angeles plant.

Irvington Varnish and Insulator Co.-Western, has announced its removal to new office and plant facilities at 1601 South Shamrock Street, Monrovia, Calif. The telephone number is ELliot 8-0136.

On September 1, the main West Coast offices of the Rubber Chemicals Division and the Dyes and Chemicals Division of E. I. du Pont de Nemours & Co., Inc., were moved to 845 East 60th St. in Los Angeles, with A. J. Mease as manager. Customers in the San Francisco area may continue to direct inquiries to 111 Sutter St. in San Francisco, and customers in the Pacific Northwest, to the DuPont sales office at 1238 N. W. Glisan St., Portland, Ore.

Staycin I Vinyl Stabilizer

A new vinyl stabilizer, "Staycin 1," designed specifically for stabilizing polyvinyl resins which contain vegetable oil-type plasticizers, is now being marketed by the Baker Castor Oil Co., New York, N. Y. The new product is said to be the first to offer stabilization against plasticizer exudation. The spew-free life of films may be extended from months to years, the company said. Staycin 1 is a complete stabilizer in that no additional stabilizers or lubricants are required. Stabilization against heat and light, as well as lubrication during processing, have been incorporated. The development of Staycin 1 is the result of the company's efforts to improve the performance characteristics of their ricinoleate and acetoxystearate vinyl stabilizers. The market for ricinoleate plasticizers, and the newer acetoxystearates, has been limited, the company stated, because of their exudation tendencies. After five years of experimentation, Baker's Technical Service Laboratory developed Staycin 1. Five-fold increases in spew-free life are made possible with the use of the product in stabilizing polyvinyl resins co-plasticized by ricinoleates.

Plant Safety Hearing Opens

Safety conditions in the Akron plant of the Goodyear Synthetic Rubber Corp. are the center of a full-dress hearing being held by the Ohio State Industrial Commission. The hearing was called on an appeal by the company which operates the plant for the Reconstruction Finance Corporation. The company is appealing an order by the commission which demands that 44 safety requirements be met. In the hearing, which began on August 26, the company charges the 44-point order is "in all respects unlawful, unreasonable, and beyond the authority" of the state director of industrial relations. The case goes back to June, 1951, when workers at the plant went on a two-week strike in a dispute over job alignment and safety measures. Later, state inspectors went through the plant and came up with the controversial order. Before that, RFC inspectors said they found the plant safe.

Vulcan C Furnace Black

Godfrey L. Cabot, Inc., Boston, Mass., has announced the production and commercial availability of Vulcan C, a new conductive oil furnace black with electrical properties said to be superior to those of standard conductive grades of carbon black now commonly in use by the rubber industry. Vulcan C, "C" for conductivity, is pelletized and offers good mixing and processing characteristics. The product has been tested in both natural and synthetic rubber and its electrical conductivity has been proved consistently greater than that provided by other grades of carbon black now popularly used, the company stated. It offers an ideal combination of high conductivity and high reinforcement. Vulcan C is recommended for use in rubber compounds wherever outstanding electrical conductivity is required.

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Announces the opening of a new

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This plant, in the heart of the cotton rug district, is equipped with every modern facility for latex compounding. It can provide rapid delivery of latex, both natural and synthetic. Through its laboratory, and if necessary the facilities of the home laboratory, your needs for special latex compounds to accomplish the most routine, or the most difficult problems in your plant, can be quickly supplied. Our compounds range from foam rubber to dipping, from adhesives to casting compounds, and from rubber thread to rug backing. Many years of know-how stand behind our services to you.

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"Research in Rubber"

GIDLEY RESEARCH INSTITUTE FAIRHAVEN, MASSACHUSETTS, U. S. A.

OBITUARIES

David M. Sellew

David M. Sellew, vice-president and general manager of the Auburn Rubber Corp., Auburn, Ind., died at the Sacred Heart Hospital in Garrett, Ind., on July 29. He was 46 years old. Born in Galesburg, Ill., Mr. Sellew received his B. S. degree in chemistry from Bowdoin College. He majored in rubber chemistry in post graduate work at Akron University. Upon completion of his formal education, he was employed as a chemist by the Goodyear Tire & Rubber Co. He resigned

that position in 1929 to accept the position of purchasing agent of Auburn Rubber. Later, Mr. Sellew was advanced to chief chemist and plant superintendent and in 1940 became vice-president and general manager. A member of the Toy Manufacturers Association, Mr. Sellew served as a director of that body. He was also a member of the Chicago Rubber and Plastics Group and the American Chemical Society. During World War II, he served in an advisory capacity to the Rubber Division of the War Production Board. He was also a member of the national panel of arbitration of the American Arbitration Association. A member of various Masonic bodies, Mr. Sellew was also a member of the Auburn Chamber of Commerce and the Auburn Rod and Gun Club. Final rites were conducted in the Auburn Presbyterian Church on August 1 with interment in Woodlawn Cemetery. He is survived by his wife and two daughters.

The largest flexible tubing ever made, constructed from neoprene coated duck by the Flexible Tubing Corp. of Guilford, Conn., is being used at the development laboratories of the Air Conditioning Division, General Electric Co. at Bloomfield, N. J.

George W. Stephens

George W. Stephens, chairman of the board of the Mansfield Tire & Rubber Co., Mansfield, Ohio, died on August 12 at his summer home at Chaska Beach on Lake Erie, Ohio. He was 72 years old. A one-time farm boy, Mr. Stephens had been associated with Mansfield for 39 years. He was president and general manager of the firm for 25 years and became chairman of the board on January 1, 1949. Born in Washburn, Ill., on May 9, 1880, he served as a school teacher as a young man. He studied telegraphy in his spare time and was employed as a telegrapher in Washburn. Then he took up the studies of bookkeeping and business administration. In 1903 he became associated with the G. & J. Tire Co. in Chicago, Ill. Ten years later he bought an interest in Mansfield Tire and became active in its management. Mr. Stephens became vice-president and general manager of the company in 1919 and was elected president in 1923. Mr. Stephens was extremely active in civic affairs. Services were held on August 15 in Mansfield. Mr. Stephens leaves his wife, one son, Paul, manager of manufacturing for Mansfield, and a daughter, Mrs. E. E. Stevens, whose husband is vice-president in charge of sales for the company.

F. A. Abbiati

F. A. Abbiati, vice-president of the Monsanto Chemical Co. and general manager of its Plastics Division at Springfield, Mass., died on August 13 at the New England Baptist Hospital in Boston, Mass. Born at Barre, Vt., on December 30, 1904, Mr. Abbiati received his B. S. degree in chemistry at the University of New Hampshire. He joined the Merrimac Division of Monsanto in Boston in 1927, and transferred to the Plastics Division in Springfield as production sales manager in 1938. Mr. Abbiati was appointed general sales manager of the division in February, 1944, and was appointed general manager of the division in October, 1950. He was elected vice-president of Monsanto in November of last year. Mr. Abbiati is survived by his wife and two children.

Sir Walrond Sinclair

Sir Walrond Sinclair, chairman of the British Tire & Rubber Co. and of the India Rubber, Gutta Percha and Telegraph Co., died on August 30 in London, England, after a long illness. He was 72 years old. Sir Walrond was a director of the Royal Bank of Scotland, and since 1941 had been a member of the Rubber Control Board of the Ministry of Supply. In 1917, he was director of national service for the London region.

Need another copy of RUBBER AGE? Use the coupon on page 831.

Whipple Jacobs

Whipple Jacobs, president of the Phelps Dodge Copper Products Corp., New York, N. Y., died recently at his home in Pipersville, Penna. He was 55 years old. Born in Chicago, Ill., Mr. Jacobs became a cost clerk in the Chicago office of the Belden Manufacturing Co. Except for his Army service in World War I, Mr. Jacobs remained with Belden Manufacturing for 34 years, until he was elected president of Phelps Dodge Copper Products on January 1, 1949. Mr. Jacobs held the position of president of Belden Manufacturing from 1939 to 1949. He was a director of the National Association of Manufacturers and a trustee of the Illinois Institute of Technology. He leaves his wife and son, and three other children by his first marriage.

Austin C. Cooley

Austin C. Cooley, formerly secretary-treasurer of John A. Roebling's Sons Co., Trenton, N. J., died of a heart attack on August 26 while on vacation at Lake Mahonk, N. Y. He was 79 years old. Mr. Cooley retired from the company in 1937. He had joined the company in 1896 and advanced through its Financial Department. He was a director of the New Jersey Manufacturers Association. His son, daughter and five grandchildren survive.

Cabot Acquires Georgia Pigment

Godfrey L. Cabot, Inc., Boston, Mass., has announced the acquisition of the Georgia Pigment Co. of Sandersville, Ga. Cabot is now able to offer air-floated and water-washed Georgia clay. This is the company's second step into the mineral pigment field. Some months ago Cabot introduced a new white mineral wollastonite. Plans for the future include expansion of the Georgia company by Cabot, to provide a complete range of high quality clays for use in rubber and other industries. To this end, Cabot has already begun installation of improvements in the manufacturing facilities of the company, and is establishing a new technical control laboratory there. The Georgia Pigment Co. will retain its name in the new Cabot organization. As in the past, William W. Kingman will be general manager, and J. T. Houk will continue his sales activities in the company.

Sees Increased Truck Tire Demand

A substantial rise in civilian demand for replacement truck tires is foreseen by Harvey S. Firestone, Jr., chairman of the board of the Firestone Tire & Rubber Co. In a recently-issued statement, Mr. Firestone noted that the period of slow replacement for truck tires is substantially over, and a marked recovery is anticipated in the next several months. Three developments are said to underlie the expected recovery in truck tire demand. Truck operators' inventories have been reduced to normal, dealer inventories are relatively low and activity in a number of industries which are large shippers by truck is again on the upgrade, he stated.

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THE HOLLISTON MILLS, INC.

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BRATEX is available in three standard qualities, 20 and 40 inch widths, 100 and 250 yard rolls. Special size rolls to order.

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50% Zinc Dimethyldithiocarbamate

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VULCACURE ZB
50% Zinc Dibutyldithiocarbamate

VULCACURE NB
47% Sodium Dibutyldithiocarbamate

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MAPICO REDS
ARE STANDOUTS IN MANY USES

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- Fine particle size
- Good aging behavior
- Moderate reinforcement
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- Footwear
- Rubber hose
- Drug items
- Sundries and
- Chemical goods

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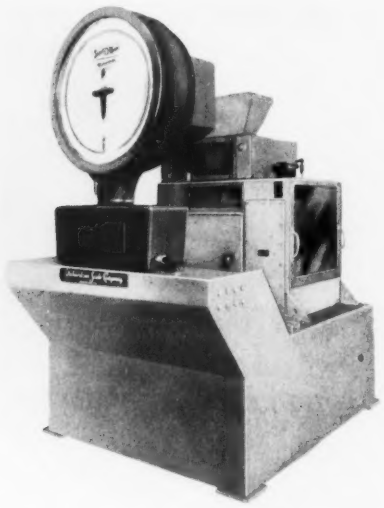
NEW EQUIPMENT

Richardson Scale Select-O-Weigh

Through application of a simple servo-mechanism, the Richardson Scale Co., Clifton, N. J., has developed what is said to be truly automatic cumulative and consecutive weighing. Called "Select-O-Weigh," the heart of the system is a simple electronic circuit with no arcing contacts making it suited to explosion-proof installation. A



standard type Richardson Automatic Scale is used as the weighing element in the system, with a pendulum dial scale acting as the force-measuring component.

A master control panel for any particular system is built to include as many setting dials as there will be ingredients in formulae handled—one dial for each ingredient. (It is possible to operate a Select-O-Weigh system for from two to twelve ingredients.) The scale operator, who may be located in any part of the plant remote from the actual weighing operation, sets each dial on the control panel to correspond with the amounts of each ingredient in his formula. Sequence of adding materials and their timing are selectively controllable.

After setting up the control panel, the "start" button is pressed. This actuates the screw feeder mechanism, delivering to the Richardson Automatic Scale the amount of material set on the first control dial and then stopping. This action is visible on the scale dial. Then, depending upon the settings of the various selections and controls, the scale either discharges to a mixer or goes on to the next ingredient, repeating the cycle and adding this ingredient to the weigh hopper in the amount indicated by setting on the second control dial. Again, the pointer on the dial moves to its new position, as the material is added, and stops the action. Control circuits may be so arranged as to provide either (1) delivery of consecutive weights of varying amounts according to a predeter-

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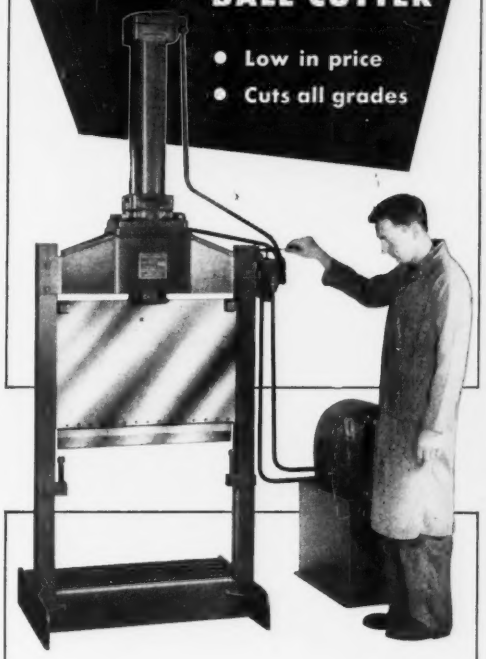
The HOLMES
CRUDE RUBBER
BALE CUTTER

- Low in price
- Cuts all grades



Special control valve...set high up ...reduces injury hazard--makes it one of the safest cutters on the market

Top performance...low operating cost...maximum safety--these are the three main reasons why the Holmes Crude Rubber Bale Cutter is in daily use in so many leading plants in the rubber industry.

As illustrated, it is a complete, self-contained unit with pump, tank, and 5 H.P. motor. Knife--29¼" wide. Stroke--23". Height--8' 5". Floor Space--36" x 64". And--the initial cost is low.

WRITE OR WIRE FOR SPECIFIC DETAILS--regardless of your particular requirements. With 50 years know-how specializing in machinery and molds for the rubber industry--Holmes can help you solve your problems, too, as they have for so many others. No obligation, of course.

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Successor to Holmes Bros., Inc.
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SPEED UP PRODUCTION...
SAVE ON COSTS...

with
RMH Western's MACHINE

CUTS WASHERS and GASKETS
PERFORATES • CREASES
and 1000 OTHER OPERATIONS

WHAT IT DOES

- Trims off all flashing.
- Air blast automatically removes scrap. (optional equipment).
- Cuts on several levels at once.
- Cuts from sheet stock or strips.
- Change from trimming flashing to gasket cutting in 1 minute with positive alignment.
- Cuts, punches and trims in one operation.

Available with or without pedestal base.

TRIMS FLASHING at ¼ the cost!

HOW IT OPERATES: Cuts on replaceable hardened steel plate • Controlled by feet—leaves hands free. Simple, positive pressure adjustment • Cutting area approximately 8½" x 9" • Operates from line shaft or ½ H. P. motor • Safe . . . operator can view entire operation.

Send for our *New Catalog* and other information concerning machinery and dies of all kinds including DINKER and WALKER DIES.

For Versatility — "GO WESTERN"
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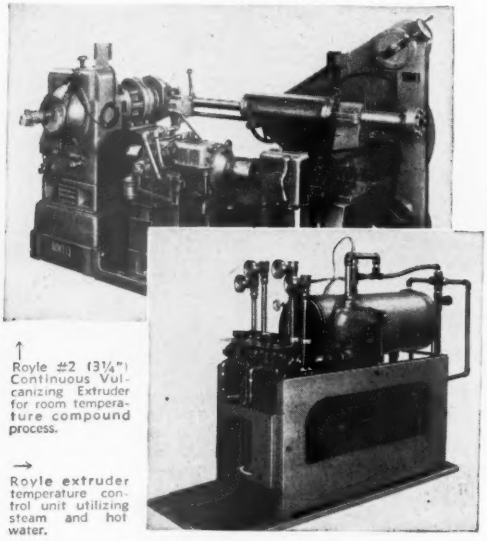
Of Particular Importance

To the Wire Insulating Industry

The room temperature compound process and associated equipment recently developed by the Western Electric Company, Incorporated, offer nine important advantages. These advantages begin with the storage of completely mixed, ready-to-extrude, rubber, GR-S, or Neoprene compounds and extend to a smoother and improved appearance for the finished product.

The complete extruder vulcanizing portion of the room temperature compound process is available to insulated wire producers* from John Royle and Sons who, for seventy-two years, have been building extruding machines to meet the most exacting process requirements.



↑ Royle #2 (3¼") Continuous Vulcanizing Extruder for room temperature compound process.

→ Royle extruder temperature control unit utilizing steam and hot water.

CHECK THESE ADVANTAGES:

- Improved diameter control
- Reduction in compound scrap
- Reduction in electrical faults
- Permits storage of completely mixed compounds
- Permits more economical scheduling of mixing equipment
- Eliminates "warm-up" operation
- Possible mill-room economies
- "Hot" machines may be converted
- Finished product has smoother finish—better appearance

Licensees of Western Electric Company

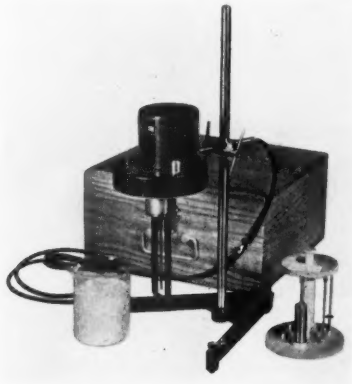
JOHN ROYLE & SONS
10 ESSEX STREET, PATERSON 3, NEW JERSEY

mined schedule, or (2) accumulation of a total batch of a pre-selected formula and its discharge to a surge hopper or mixer as a whole.

Following discharge of the automatic scale, a tare check circuit is brought into operation to prevent the scale from initiating the next weighing unless all material is cleared from the weigh hopper and the unit is in perfect empty balance. This is accomplished by electrically verifying the repositioning of the dial scale pointer at exact zero or empty balance position. A further elaboration of the system is the operation of repeater dials to indicate remotely the position of each scale pointer.

Brookfield Synchro-Lectric Viscometers

The addition of several new models to its line of Brookfield Synchro-Lectric Viscometers has been announced by the Brookfield Engineering Laboratories, Inc., Stoughton, Mass. A number of new features have also been added to all of the company's standard models. For example, all models now feature a new bubble level permanently attached to the instrument for proper leveling either in a laboratory stand or when making point-



of-process determinations. Also, any standard model now may be secured with explosion-proof construction when such is desired. The latter modification adds very little to the instrument's weight and bulk and thus does not affect its portability.

Among the new models added to the line is the eight-speed Brookfield Viscometer, illustrated herewith. With its 200 to 1 ratio of speeds starting at .3 rpm, users are finding this new model especially ideal where wide ranges of viscosity either are or may be encountered. When equipped with a UL adapter, a company-developed accessory that is designed to provide special amplifying effects, this model, known as the Model LVT, can measure any viscosity between .5 cps and 2,000,000 cps with extreme accuracy.

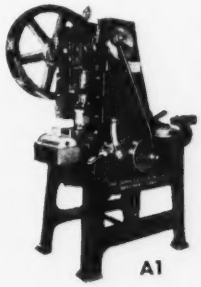
In addition to this model, and a new modified four-speed model, the new line includes some 10 other single and four-speed models, available in various rpm's up to 600.

Men who Know PRODUCTION MACHINES Choose

the James COULTER Machine Co.
BRIDGEPORT, CONN.

For MORE than Half a Century the name COULTER has meant MORE in higher quality cuttings . . . MORE IN GREATER PRODUCTION.

MODEL A-1
Cutting Heels at high speed production or short runs.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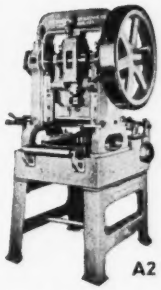
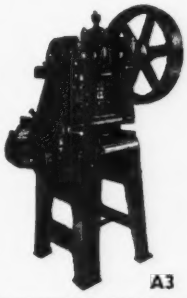

A2

MODEL A-2
Cutting Multiple Heels, Half and Full Soles with stock grain.

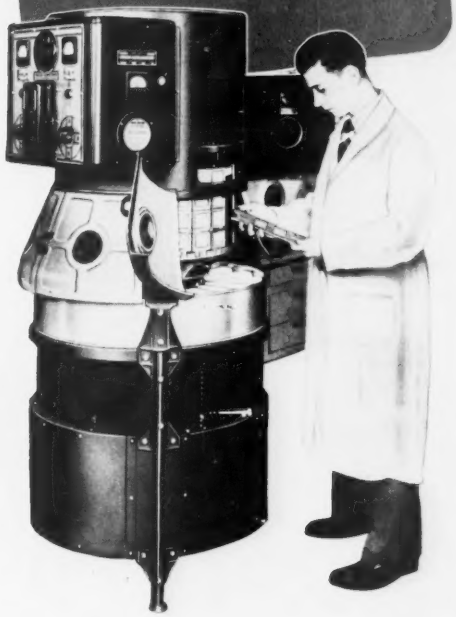
MODEL A-3
Cutting Multiple Heels and Taps with or across stock grain.

MODEL A-2s
(Not illustrated)
Cutting across grain of stock.


A3

COULTER PRODUCTION MACHINES SINCE 1896

OVER 2500 FADE-OMETERS *are now in use*



for maintaining quality control in the manufacturing of a wide variety of products from all kinds of textiles including many types of synthetics, to printing inks, plastics, wallpaper, and any product subjected to the deteriorating effect of sunlight in use. This machine is also widely used for testing the fading, and resistance to sunlight of many new products now in the process of development. Positive, dependable results can be obtained in the laboratory in a fraction of the time required by any other method of testing. Exact duplication of tests can be made at any time in the process of improving the resistance to sunlight of any product. *Write for complete information and scientific data on the operation of the Atlas Fade-Ometer.*

ATLAS ELECTRIC DEVICES COMPANY
361 W. Superior St., Chicago 10, Illinois, U.S.A.
Manufacturers of accelerated testing equipment for over a quarter of a century.

WEATHER-OMETERS • LAUNDER-OMETERS • FADE-OMETERS

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Vulcanized
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Types, grades and blends
for every purpose, wherever
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A long established and proven product.

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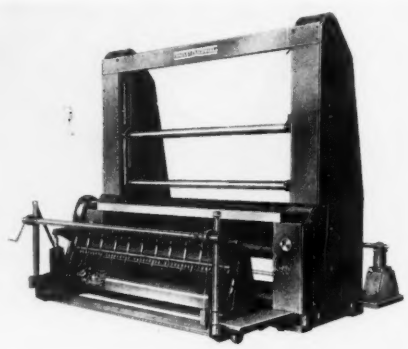
B & S No. 25 Surface Rewinder

Mounted on a heavy bedplate to eliminate vibration, the new No. 25 Surface Rewinder manufactured by the Bagley & Sewall Co., 101 Pearl Street, Watertown, N. Y., is fully-enclosed to insure cleanliness. Designed



for 32 to 92 inch length and up to 42 inch diameter rolls, the unit has a 2,000 fpm speed capacity. It is equipped with a power-driven roll lift and air-operated slitting units for strips as narrow as ½ inch.

Quicker extinguishment of fires is claimed for the new **Automatic Protecto-Spray Unit** recently introduced by the Grinnell Co., Inc., Providence, R. I., which fights fires at the molecular level by diluting the active ingredients of flame. When used in place of standard automatic sprinklers for special hazard protection, such as high piled tire storage, the unit is said to reduce ceiling scorch and to check fire spread with 30% less water.

SEE PAGE 708

Fiber-Free Rubber for Reclaim

(Concluded from Page 780)

3. Chemical savings are indicated. In 1945 this method accounted for 2% of all the caustic produced in the U.S.

4. Lower percentage of fines from the S-W system should substantially decrease losses through draining screens. The fraction of production stock 7780 finer than 10 mesh had a bulk density of 16.5 lbs./cu. ft., and the following size distribution:

Mesh	16	20	28	35	60	100	−100
(%)	56	7	12	8	8	6	3

This corresponds to less than 4% finer than 35 mesh for the over-all stock.

5. The pollution load imposed on the receiving stream is substantially reduced.

ADVANTAGES FAVORING NEWER PROCEDURES

1. A source of fiber-free stock is assured.
2. Chemical costs may be largely eliminated.
3. Water supply and companion stream pollution problems of the digestion methods do not exist.
4. The equipment as well as auxiliary facilities is generally much less elaborate than for the digestion method.
5. Substantial economies in building accommodations are indicated. (This may mean an important reduction in critical raw materials as well).
6. The exacting technical conditions required for reclaiming may be more easily attained than with digestion systems.
7. Advantage can be taken of a shorter devulcanizing cycle.
8. Continuous operation has been proven practical.

ACKNOWLEDGMENTS

The writer wishes to thank Mr. Plumb and Mr. Sverdrup of the U. S. Rubber Reclaiming Co. as well as Mr. Fisher and his associates at the Tire Reclaiming Division of the Goodyear Tire & Rubber Co. for reviewing this article. To Mr. Earland E. Harvey, consulting engineer under whose direction the Sprout-Waldron fiber recovery system at Buffalo was installed, a similar expression of gratitude is due. The equipment photographs obtained through the courtesy of the U. S. Rubber Reclaiming Co. show the installation furnishing rubber for the continuous DHP reclaim process at their new Cheektowaga Plant. Tables I and III are summaries based on statistics obtained from the Rubber Manufacturers Association. The caustic digestion flow sheet (Figure 1) is reproduced by permission of "Chemical Engineering."

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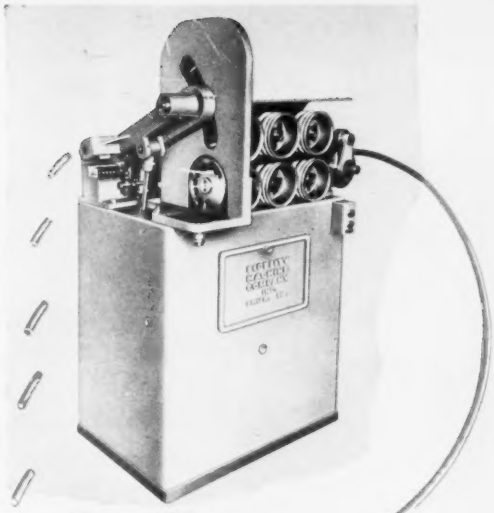

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automatically

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Measuring and Cutting Machines

Revolutionary in design, the Fidelity Automatic Hose Measuring and Cutting Machine enables you to reduce labor costs, improve quality, boost output, prevent waste, and save floor space.

The Fidelity feeds, measures, counts and *cuts* hose automatically to any present length and holds the closest tolerances. It takes only a moment to change length or diameter. One operator can handle several of these new Cutting Machines. No special skills are required and the operation is 100% *safe*.

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FOR FINER
CUTTING DIES of all kinds
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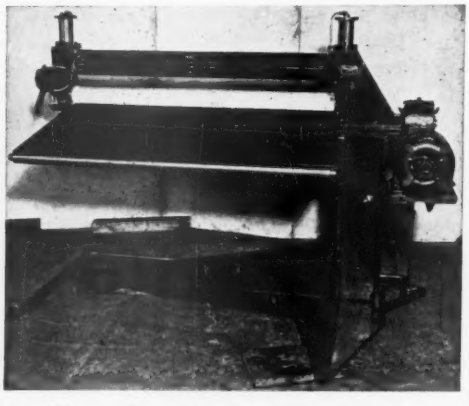

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REVIEWS

BOOKS

Technology of Coated and Processed Papers. Edited by Robert H. Mosher. Published by Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, N. Y. 5½ x 8½ in. 734 pp. $15.00.

A companion piece to the book on "Specialty Papers—Their Properties and Applications" issued in 1950, which was devoted to specific types of papers and their uses and characteristics, this book covers the equipment and methods for producing and evaluating the papers covered in the first volume. All of the general types of operations involved in the converting of paper are outlined in the book, as well as the equipment used in converting operations and the methods used to evaluate the finished products. The entire volume is written from the angle of the technologist, the engineer and the chemist.

The book represents the work of several experts in specific phases of the paper industry, all of it ably uniformized from the standpoint of style and structure by the editor. Among the contributors are William A. Abramowitz, president of the American Resinous Chemicals Corp., who furnished the chapter on "Saturating Agents and Paper Saturation;" Ralph T. Nazzaro, technical director of Texon, Inc., the chapter on "Theory of High Polymers and their Application to the Paper Converting Industry," and J. C. Perrone, director of research of the Watson-Standard Co., the chapter on "Organosol and Plastisol Coatings." There are 14 chapters in all, plus a subject index. The use of both natural and synthetic latices is discussed.

•

Work Measurement: New Principles and Procedures. By Adam Abruzzi. Published by Columbia University Press, Morningside Heights, New York 27, N. Y. 6 x 9 in. 290 pp. $6.00.

Convinced that most of the procedures now used for work measurement do not perform their intended functions, since practically all of them are intimately associated with the bargaining process, Dr. Abruzzi adopted the viewpoint that these procedures should be based on the rules of scientific methods. Using a new research method based on modern experimental inference, he conducted a series of intensive studies of representative industrial operations, the results of which are presented in this volume. The book makes available for the first time objective procedures and criteria for deciding when a process can be considered standardized and for determining when element and motion standard data have predictive value. It presents a complete methodology for handling the problems of work measurement, with the opening chapters analyzing present methods of investigating these problems. The author presents his own objective procedures using experimental data on industrial operations, making liberal use of statistical quality control and other statistical techniques which have proved so successful in product quality work. The book has 14 chapters, 25 figures and 55 tables. It is a challenging new book for engineers.

•

The Measurement and Control of Temperatures in Industry. By R. Royds. Published by the Chemical Publishing Co., Inc., 212 Fifth Ave., New York 10, N. Y. 5½ x 8½ in. 260 pp. $5.00.

As indicated by its title, this book covers the latest developments in temperature measurement and control in various industries, including the rubber manufacturing field. The various methods and equipment which are available for the measurement of temperature in each particular range are discussed, with considerable space devoted to standardization and automatic control. Attention is given to improving the quality and reliability of industrial products, an increased rate of production, and the saving of fuel and labor by the application of automatic temperature controls. The numerous equations included for calculating results should prove of much help to engineers.

BOOKLETS, CATALOGS, etc.

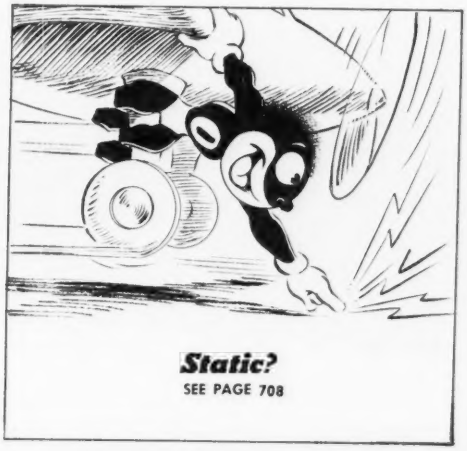
Witco Continex High Abrasion Furnace Black in Natural and Chemical Rubbers. Witco Chemical Co., 295 Madison Ave., New York 17, N. Y. 8½ x 11 in. 88 pp.

The performances of Continex HAF and other competitive HAF blacks are compared in this technical report, with the results shown in table and graph form. Besides discussing the properties of HAF blacks and showing electron micrographs of particles, the report deals with comparative performances of HAF blacks in natural rubber, standard GR-S X-539, LT1 GR-S X-478, GR-I-17, Hycar OR-25-E.P. and Neoprene Types GN and W. The graphs and tables are shown at the beginning of the section on each elastomer covered to simplify the comparisons of the different HAF blacks at each loading, typical tread compounds, for example, being shown at 30, 40, 50 and 75 parts loading. A special section of the report is devoted to a discussion of HAF black test procedures, rubber mixing procedures, and rubber test procedures. The results presented in this report indicate that despite the high pH of the HAF blacks, its outstanding reinforcing and abrasion resistant properties can be procured in both natural and synthetic rubbers without undue processing difficulties by proper adjustment of accelerators and other compounding ingredients.

•

Calco Rubber Chemicals. Calco Chemical Division, American Cyanamid Co., Bound Brook, N. J. 10½ x 11½ in. Looseleaf.

Comprehensive data on the chemical, physical and compounding properties of the company's rubber chemicals, which now cover most of the unit operations in rubber compounding, are furnished in this handsomely prepared manual. The various chemicals and compounding ingredients are described in a manner designed to be especially useful to purchasing agent, compounder and analytical chemist alike, and the manual is presented in loose-leaf binder form so that inserts can be included from time to time. Materials covered in the manual now include accelerators, antioxidants, peptizers, retarders and stiffening agents. Specifications are furnished on all these products, while a special section is devoted to analytical test methods. Included in the latter section are methods for determining melting range, fineness, moisture, ash, copper, manganese, etc. Some reference data is also furnished in the manual, including a temperature conversion chart, an equivalent cure or scorch chart, conversion factors, and the specific gravity of common and miscellaneous compounding ingredients.



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REVIEWS (CONT'D)

Imagineering with Silicone Rubber. (Bulletin CDS-3). Chemical Division, General Electric Co., Pittsfield, Mass. 8½ x 11 in. 24 pp.

This bulletin includes comprehensive information on the properties, applications, classes, and design specifications of G-E silicone rubber. The applications illustrated in the booklet clearly show how the unique properties of G-E silicone rubber are helping to make better products, improve production processes and develop entirely new products. The bulletin explains what silicones are, methods of fabrication, properties and applications, and the different classes of silicone rubbers. Physical and chemical test data as well as chemical resistance data is included.

•

Allspeed Motor Drives. (Bulletin AS-1600-B6). Worthington Corp., Harrison, N. J. 8½ x 11 in. 16 pp.

Allspeed Motor Drives of from ¼ to 7½ horsepower are described in this bulletin. Described and pictured are both upright and horizontal drives of either closed or skeleton types. Sixteen pictures graphically portray the ease of belt change. Discussed are such problems as service, electric motors, torque, bases, adverse operating conditions, shaft variations and mounting. Selection tables are also offered, one describing how to select the proper drive, and others on operation and maintenance. Dimensions and line drawings on the various drives are also featured.

•

Fisher Unitized Laboratory Furniture. (Catalog No. 25). Fisher Scientific Co., 717 Forbes St., Pittsburgh 19, Penna. 8½ x 11 in. 30 pp.

The Fisher "Unitized" line, described in this booklet, consists of 21 basic units of standardized steel furniture that can be quickly and easily joined to equip laboratories of any size, shape and type. Construction features of the individual units are outlined as are their specifications and the uses to which they may be put. The booklet also discusses the matter of accessories and covers the subject of installation. Another interesting feature of the booklet is a section on planning the laboratory.

•

Exacting Jobs in Industry. B. F. Goodrich Chemical Co., 324 Rose Bldg., Cleveland 15, Ohio. 8½ x 11 in. 16 pp.

This booklet attempts to underline the multitudinous applications for Hycar. Only products made from dry sheet rubbers and phenolic blends are discussed and typical applications are described and illustrated. Hycar is shown to have use as a cockpit seal in jet aircraft and as a filling compound for airplane propellers. Its use in diesel electrical systems and in oil pipe lines is also discussed. Hycar phenolic parts and adhesive as used in the shoe industry are also outlined as are many other interesting applications.

•

Styrene Monomer. Texas Division, Monsanto Chemical Co., Texas City, Texas. 8½ x 11 in. 44 pp.

Styrene monomer and its derivatives, rapidly becoming high-volume, low-cost basic materials for the chemical and chemical processing industries, are described in this booklet. In addition to characteristics and uses for various styrene derivatives—styrene-butadiene emulsions, styrene-polyester resins, elastomers, styrene-modified alkyd resins and styrenated oils—this illustrated booklet contains a comprehensive list of patent and literature references to styrene copolymers and reaction products.

•

New Techniques in Valve Control Design. Conoflow Corp., 2100 Arch St., Philadelphia 3, Penna. 8½ x 11 in. 16 pp.

This comprehensive bulletin offers in concise and understandable language a complete review of the development of present-day conventional control valves and offers a glance into the future designs of tomorrow. The bulletin is well-illustrated and fully explains the underlying reasons for today's designs and the logic behind the predicted designs for the future. The entire subject of pneumatic final control elements is treated.

Wet Blasting in Precision Finishing. (Bulletin No. 43). American Wheelabrator & Equipment Corp., 1290 South Byrkit St., Mishawaka, Ind. 8½ x 11 in. 6 pp.

This brochure shows the application of wet blasting to such work as die and mold finishing, die and mold maintenance, tool finishing and deburring, heat treat scale removal, and surface preparation for plating in all applications where close tolerances on work must be maintained. The brochure is fully illustrated, showing parts before and after wet blasting and also showing some typical installation photographs of parts being cleaned. Among the operations represented by actual examples are rubber molding, plastic molding, extruding, heat treating, etc.

•

Control of Dermatitis in Industry. West Disinfecting Co., 42-16 West St., Long Island City 1, N. Y. 8½ x 11 in. 28 pp.

Skin diseases annually cost industry $100,000,000. This booklet presents a simple, inexpensive prevention and control program for guaranteeing personal cleanliness, protecting exposed skin areas, preventing clothing contamination, and guarding against special hazards. A six-page chart covering a wide range of industries lists various working conditions, types of dermatitis prevalent where these conditions exist, and suggested preventive measures for each. Hazards encountered in the working of natural and synthetic rubber are covered.

•

Thiokol Liquid Polymer LP-2. Thiokol Corporation, 780 No. Clinton Ave., Trenton 7, N. J. 8½ x 11 in. 4 pp.

Thiokol LP-2 is a viscous liquid which converts to a tough, solvent-resistant rubber at normal working temperatures without shrinkage. Representative applications of the polymer are briefly described and illustrated in this two-color brochure. Among these are impregnation, protective coatings, filleting, repairing and patching, binding, sealing, and caulking. Physical properties of the polymer are included. Some data on compounding and curing is also included.

•

B-H Industrial Insulations. Baldwin-Hill Co., 1108 Breunig Ave., Trenton 2, N. J. 8½ x 11 in. 20 pp.

Insulating materials which cover the complete temperature range from 150° to 1800° F. are described in this illustrated catalog. Insulating cement, block, blanket, felt, and pipe covering are a few of the products shown in the catalog. Complete with thermal-conductivity graphs and heat loss charts, this catalog also gives brief application descriptions together with typical uses, sizes, packaging, and densities.

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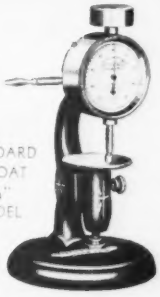

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MARKETS

Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings

NEW YORK, SEPT. 5, 1952

Natural Rubber

Since our last report (August 6), the price of spot rubber on the New York Commodity Exchange has swung in a range of 3.25c, high for the period being 30.25c reached on August 8, 11 and 12, and low being 27.00c reached on September 4. The average price of spot rubber for the month of August was 29.36c based on 21 trading days. This compares with 30.52c in July.

Without any new developments to indicate an early change in present conditions, rubber traders both here and abroad are adhering to a policy of watchful waiting. Minor upturns meet with the pressure of physical rubber while declines attract sufficient demand with the result that price fluctuations are restricted to narrow limits.

It is interesting to note that stocks available to industry as of the end of July were estimated at over 88,000 tons by the Rubber Manufacturers Association, almost 16,000 tons more than the month before. This higher figure represents a substantial increase in the ownership of rubber by U. S. dealers and importers.

Today's quotations for the outside market, London and Singapore, follow:

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.36½
September	.27¼
October	.26¾
Thin Latex Crepe	
Spot	.36½
February	.36½
Thin Brown Crepe, No. 2	.22
Smoked Blankets	.21¼
Flat Bark Crepe	.18½

London Market

(Standard Smoked Sheets)

October	26.25
December	26.25

Singapore Market

(Standard Smoked Sheets)

September	25.92

Closing Rubber Prices on New York Commodity Exchange (No. 1 R.S.S. Contract)

FROM AUGUST 7 TO SEPTEMBER 5

Aug.	Spot	Dec.	Mar.	May	July	Sales
7	30.00	28.60	27.90	27.50	27.30	32
8	30.25	28.75	28.00	27.80	27.60	71
9						
10						
11	30.25	28.95	28.00	27.80	27.50	65
12	30.25	28.85	27.90	27.80	27.60	6
13	30.00	28.80	27.90	27.80	27.50	40
14	29.75	28.50	27.60	27.50	27.00	120
15	29.75	28.50	27.60	27.40	27.00	26
16						
17						
18	29.65	28.40	27.40	27.30	26.50	50
19	29.65	28.60	27.80	27.40	27.00	86
20	29.60	28.60	27.70	27.40	27.10	32
21	29.50	28.40	27.50	27.10	26.85	1
22	29.38	28.05	27.15	26.70	26.45	24
23						
24						
25	28.13	26.75	26.00	25.50	25.40	80
26	27.50	26.85	26.10	25.60	25.45	68
27	27.75	27.05	26.20	25.80	25.55	97
28	28.25	27.40	26.50	26.05	25.80	82
29	27.75	27.00	26.00	25.65	25.40	48
30						
31						
Sept.						
1						
2	27.75	27.30	26.35	26.00	25.65	29
3	28.00	27.35	26.50	25.95	25.70	28
4	27.00	26.00	25.20	24.75	24.50	234
5	27.25	26.25	25.50	25.25	25.00	133

Scrap Rubber

Activities in the scrap rubber market continues at the low levels evidenced during the past few months. While mills closed for temporary vacation periods have now re-opened, the trade is loathe to predict any immediate improvement in the general situation. Meanwhile, prices on all grades of scrap rubber are being considered as nominal. The prices below represent ceilings established by the Office of Price Stabilization.

(Prices Delivered Akron)

Mixed tires	ton	$26.00
Mixed beadless tires	ton	34.00
Light colored carcass	ton	130.00
Black carcass	ton	50.00
No. 1 peelings	ton	65.00
No. 2 peelings	ton	42.00
No. 3 peelings	ton	38.00
Buffings	ton	30.00
Truck and Bus S.A.G.	ton	28.00
Passenger S.A.G.	ton	28.00
Mixed S.A.G.	ton	26.00
Light colored tubes	lb.	.16
Natural rubber red tubes	lb.	.16
Natural rubber black tubes	lb.	.11½
Mixed natural rubber tubes	lb.	.10
Butyl rubber tubes	lb.	.057
GR-S rubber tubes	lb.	.02
Mixed synthetic tubes	lb.	.03

Reclaimed Rubber

According to the Department of Commerce, 143,884 long tons of reclaimed rubber were consumed in the first six months of 1952, contrasted with the 191,500 long tons consumed in the first six months of the preceding year. Market activities continue dull, with prices considered nominal. OPS-established prices for reclaimed rubber follow:

(Prices for All Areas Except Calif.)

Premium Grade Whole Tire	.10½
First Line Whole Tire	.10
Second Line Whole Tire	.09½
Third Line Whole Tire	.09¼
Fourth Line Whole Tire	.08¾
Black Carcass	.14½
No. 1 Light Colored Carcass	.20¾
No. 1 Select Peel	.11¾
No. 1 Peel	.10½
Butyl Tube Reclaim	.14½
S.P. Natural Rubber Black Tube	.21
Natural Rubber Black Tube	.20
Natural Rubber Red Tube	.24½
Natural Rubber Gray Tube	.24¼

Cotton Tire Fabrics

Trade sources indicate that there has not been too much activity in the cotton tire fabric market within the past few weeks, although there has been moderate activity centered about chafers. The Bureau of the Census reports that 603,913,000 pounds of tire cord and fabric were produced in 1951, against 523,033,000 in the previous year. Current prices follow:

Standard, Peeler, 12/4/2	lb.	.85
Extra Staple, Peeler, 12/4/2	lb.	.91

Chafers

14.4 oz. (per square yard)	lb.	.81
9.25 oz. (per sq. yard)	lb.	.75½
11.65 oz. (per sq. yard)	lb.	.72
8.9 oz. (per sq. yard)	lb.	.77½

Cotton

The price of middling uplands on the New York Cotton Exchange has swung in a range of 2.10c since our last report (August 6), high for the period being 41.65c reached on August 7, and low being 39.55c reached on August 22. The average price of middling uplands for the month of August was 40.42c based on 21 trading days. This compares with an average of 40.37c in July.

The board of governors of the New York Cotton Exchange at a meeting on August 28, voted to close the Exchange all year round on Saturdays. The Exchange also announced that as soon as the by-laws can be changed, probably within the next few weeks, trading hours will be from 10:30 A.M. to 3:30 P.M. for the five-day week. The Exchange now is open for trading on Mondays through Fridays from 10:00 A.M. to 3:00 P.M.

The Agriculture Department has reported that the supply of cotton during the 1952-53 marketing year, which began August 1, will total about 17,500,000 bales. The report said that the supply would represent 1952 production of about 14,600,000 bales, August 1 carry-over of 2,700,000 bales from the 1951 crop and expected imports of 150,000 bales.

The Department has also announced that government standards for grades of American upland cotton will be revised effective August 15, 1953. The revision will abolish all standards for extra white cotton and the middling fair and strict good middling standards for white cotton. It will also change the standards so as to reflect more accurately the characteristics of recent cotton crops. The revisions do not go into effect until next year because of stipulations in the Cotton Futures and Cotton Standards Acts.

Quotations for middling uplands on the Exchange follow:

	Aug. 6	September 5		
	Close	High	Low	Close
Oct.	38.92	39.44	39.20	39.28
Dec.	38.65	39.36	39.10	39.20
Mar.	38.50	39.25	39.03	39.16

Synthetic Rubber

(Dry Types—Per Pound)

Butaprene NF	.490	.500
Butaprene NS	.500	.510
Butaprene NAA	.540	.550
Butaprene NXM	.580	.590
Chemigum 30N4NS	.500	.510
Chemigum 50N4NS	.500	.510
Chemigum N3	.580	.590
G-E Silicone Rubber (compounded)	3.15	4.00
G-E Silicone Gum (not compounded)		4.48
GR-I		.2075
GR-S		.230
Hycar OR-15	.580	.590
Hycar OR-25	.500	.510
Hycar OS-10	.550	.560
Neoprene Types CG and AC		.500
Neoprene Type E		.650
Neoprene Types FR and KNR		.800
Neoprene Type GN		.380
Neoprene Type GN-A		.380
Neoprene Type RT		.400
Neoprene Type S		.380
Neoprene Type W		.400
Paracril B	.500	.510
Paracril BJ	.500	.510
Paracril C	.580	.590
Silastic (compounded)	2.35	4.40
Thiokol Type A		.470
Thiokol Type FA		.640
Thiokol FR-1		.950
Thiokol Type ST		1.000

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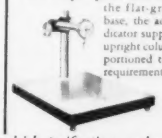

Ames No. 130 is designed especially for inspecting comparatively large and odd-shaped parts. For this reason, the flat-ground steel base, the adjustable indicator support, and the upright column are proportioned to the user's requirements.

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STATISTICS *Of Interest to the Rubber Industry*

U. S. Imports and Re-Exports of Natural Rubber

	GROSS IMPORTS										RE-EXPORTS		TOTAL NET IMPORTS
	Natural Rubber (Dry)			Natural Rubber (Latex)			Guayule						
Year	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Long Tons	Total Declared Value	Average Declared Value per pound Cents	Total Gross Imports Long Tons	Long Tons	Total Declared Value	Long Tons
1936	467,064	152,072,496	14.54	19,852	6,659,899	14.98	1,229	286,552	10.41	488,145	12,581	4,488,223	475,564
1937	574,600	237,307,041	18.44	23,185	10,213,670	19.67	2,691	745,873	12.37	600,476	7,948	3,386,408	592,528
1938	397,640	125,373,864	14.08	11,944	4,168,127	15.58	2,508	628,886	11.19	412,092	5,652	1,799,124	406,440
1939	469,946	167,586,780	15.92	27,437*	10,467,552	17.03	2,233	463,345	9.27	499,616	13,125	5,832,618	486,491
1940	781,202	303,308,823	17.33	33,789	14,593,466	19.28	3,633*	758,007	9.31	818,624	7,060	3,197,336	811,564
1941	989,498	401,976,317	18.14	34,797*	15,965,627	20.48	4,881	1,145,767	10.48	1,029,176	5,376	2,757,872	1,023,800
1942	266,276	112,537,426	18.87	10,646	5,630,667	23.61	5,523	1,660,792	13.42	282,445	10,856	5,913,386	271,589
1943	50,358	31,369,198	27.81	1,890	1,312,202	31.00	7,678*	3,636,789	21.14	59,926	22,583	16,446,707	37,343
1944	103,847	73,908,549	31.77	3,091	2,092,211	30.22	6,701*	3,351,233	22.33	113,639	9,739	8,712,695	103,900
1945	134,408	95,814,102	31.82	4,773	3,115,853	29.14	10,040	5,963,797	26.52	149,221	9,509	7,201,746	139,712
1946	376,502	228,796,110	27.13	8,421	5,843,085	30.98	5,344	2,859,246	23.89	390,267	7,711	5,331,954	382,556
1947	691,087	306,951,814	19.83	17,542	9,787,722	24.91	2,884	1,492,825	23.11	711,513	4,121	2,354,494	707,392
1948	702,293	290,849,177	18.49	32,745	18,288,223	24.93	302	71,330	10.53	735,340	6,672	3,259,324	728,668
1949	630,808	225,343,624	15.95	29,743	14,968,650	22.47	.....	.....	.....	660,551	6,253	2,746,109	654,298
1950	747,109	416,222,598	24.87	54,401	41,764,486	34.27	739	254,331	15.37	802,249	8,640	6,832,821	793,609
1951	677,874	727,343,348	47.90	54,963	80,178,309	65.12	1,619	1,258,941	34.71	734,456	2,603	3,947,740	731,853
1951:													
Apr.	48,931	55,238,582	50.31	5,850	9,604,002	73.29	182	183,311	44.93	54,963	3	3,942	54,960
May	37,737	44,187,969	52.27	4,534	7,584,613	74.67	99	80,285	36.16	42,370	7	11,132	42,363
June	51,811	61,809,219	53.26	4,692	7,475,970	71.13	120	84,110	30.14	56,623	224	423,689	56,399
July	67,511	78,807,699	52.11	5,619	8,522,995	67.71	154	99,482	28.82	73,284	.....	.....	73,284
Aug.	66,217	70,536,735	47.55	4,529	5,805,789	57.23	148	93,807	28.31	70,894	159	290,479	70,735
Sept.	59,309	57,619,906	43.44	1,800	1,838,512	45.59	121	78,427	29.00	61,230	89	45,061	61,141
Oct.	51,850	49,109,610	42.28	3,055	3,499,763	51.15	206	149,590	32.42	55,111	73	120,779	55,038
Nov.	54,561	51,161,914	41.79	2,620	3,251,833	55.42	107	75,370	32.19	57,278	67	96,521	57,211
Dec.	44,332	42,695,894	42.99	860	1,190,609	61.82	171	110,448	28.79	45,363	25	22,732	45,338
1952:													
Jan.	80,561	76,995,564	42.67	2,569	3,299,142	39.95	153	97,922	28.60	83,283	140	207,976	83,143
Feb.	73,781	70,775,631	42.82	2,556	3,016,023	52.66	45	29,061	28.58	76,382	95	120,410	76,287
Mar.	81,577	76,567,896	41.90	3,570	4,149,537	51.88	25	12,701	22.68	85,172	93	127,007	85,079
Apr.	78,098	71,497,007	40.87	4,821	4,402,416	40.77	55	27,927	22.67	82,974	85	103,819	82,889
May	55,764	45,898,163	36.74	3,409	3,140,619	41.12	15	7,644	22.62	59,188	130	159,568	59,058

Source: Bureau of the Census, U. S. Department of Commerce. * Adjusted to agree with total gross imports.

Notes: (1) Figures for latex are on a dry weight basis. (2) Figures for re-exports include natural rubber (dry and latex) and guayule. (3) In the years 1940 through 1943, crepe sole rubber imports were reported under a separate classification. Such imports, which are included under natural rubber, dry above, were: 856,294 pounds, valued at $191,097 in 1940; 379,607 pounds, valued at $85,924 in 1941; 662,503 pounds, valued at $159,530 in 1942; and 21,653 pounds, valued at $5,215 in 1943.

Natural Rubber
(Including Latex and Guayule)

(All Quantities in Long Tons)

Year	New Supply	Consumption	Re-Exports	Stocks On Hand at End of Period
1936	488,145	575,000	12,581	223,000
1937	600,479	543,600	7,902	262,204
1938	411,983	437,031	5,652	231,500
1939	499,473	592,000	13,125	125,800
1940	818,243	648,500	7,060	288,864
1941	1,029,067	775,000	5,376	533,344
1942	282,653	376,791	10,856	422,714
1943	55,329	317,634	20,815	139,594
1944	107,834	144,113	9,665	93,650
1945	135,672	105,429	6,743	118,715
1946	400,687	277,597	4,338	237,467
1947	688,354	562,661	4,101	129,038
1948	735,225	627,332	6,623	141,541
1949	660,792	574,522	6,253	106,619
1950	802,249	720,268	8,644	89,215
1951	733,048	454,015	2,603	76,569
1951:				
Apr.	54,781	39,508	185	71,679
May	42,271	42,445	151	68,498
June	56,504	39,998	224	68,369
July	73,180	35,478	...	67,816
Aug.	77,338	36,506	158	67,491
Sept.	61,499	36,887	27	56,941
Oct.	55,219	37,407	73	63,501
Nov.	57,108	35,037	67	63,689
Dec.	45,193	33,236	25	76,569
1952:				
Jan.	83,130	36,776	140	75,123
Feb.	76,338	34,642	95	73,599
Mar.	85,147	35,489	93	61,263
Apr.	82,919	36,364	85	59,272
May	59,173	36,292	130	63,828
June	67,169	36,875	108	72,858

Source: Rubber Division, NPA, U. S. Department of Commerce.

U.S. Gross Imports of Balata, Jelutong, Gutta-Percha, etc.

(All Quantities in Long Tons)

	Balata		Jelutong		Gutta-Percha & Other Guttas	
Year	Tons	Value	Tons	Value	Tons	Value
1936	535	199,368	6,163	1,296,364	1,568	555,643
1937	354	151,344	7,109	2,017,786	1,122	440,894
1938	509	181,140	9,132	2,944,504	444	204,582
1939	694	265,553	6,640	1,603,418	1,740	539,255
1940	648	300,500	7,451	2,449,137	2,340	1,004,885
1941	924	489,514	8,821	2,954,001	1,783	607,025
1942	1,544	1,107,059	1,200	530,296	804	525,763
1943	1,047	708,701	35	14,840	.....	.....
1944	1,012	660,805	88	45,578	10	4,999
1945	1,361	907,253	.....	.....	36	21,970
1946	2,281	2,233,065	304	256,169	423	458,064
1947	1,982	2,276,531	2,878	1,409,887	392	779,591
1948	1,195	805,078	3,401	2,377,765	423	542,788
1949	1,391	814,554	1,043	834,978	197	189,021
1950	2,117	1,589,885	1,789	1,515,162	541	745,418
1951	2,452	1,973,271	1,669	2,608,359	383	430,539
1951:						
Mar.	30	22,838	192	222,934	33	65,143
Apr.	364	241,725	86	180,518	43	39,402
May	306	200,459	130	194,904	26	22,515
June	227	153,222	151	350,828	72	63,998
July	115	94,073	193	308,232	23	32,106
Aug.	121	136,723	142	224,194	8	7,060
Sept.	307	227,392	62	105,395	12	14,660
Oct.	368	383,056	138	241,246	5	6,175
Nov.	148	123,442	167	270,242	33	26,011
Dec.	96	113,773	52	99,761	8	23,467
1952:						
Jan.	126	95,203	204	375,802	27	59,439
Feb.	31	23,118	15	211,239	10	33,474
Mar.	50	43,207	128	217,096	27	43,861
Apr.	49	31,239	234	409,076	32	41,591
May	57	32,488	92	141,257	26	27,833

Source: U. S. Department of Commerce.

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Synthetic Rubber—Totals

(GR-S, Neoprene, Butyl, and Buna N Types)

(All Quantities in Long Tons)

Year	Production	Imports	Consumption	Exports	Stocks On Hand at End of Period
1941	8,383	.....	6,259	572	1,702
1942	23,434	.....	17,651	1,419	4,612
1943	231,722	.....	170,891	18,148	41,568
1944	762,630	11,043	566,670	104,266	142,927
1945	820,373	10,407	693,580	83,778	203,454
1946	740,026	7,709	761,699*	72,920	114,963
1947	508,702	1,093	559,566	11,385	62,366
1948	488,143	13,671	442,072	4,874	115,111
1949	393,690	12,242	414,381	6,483	98,042
1950	476,184	25,722	538,289	7,652	52,758
1951	845,155	10,085	758,897	9,249	129,420
1952:					
Feb.	73,087	1,058	65,667	2,128	144,281
Mar.	78,166	1,489	68,744	3,488	150,084
Apr.	77,452	1,320	67,592	2,404	158,622
May	69,543	1,592	66,439	2,326	153,339
June	63,236	2,293	65,562	2,365	150,671

Source: U. S. Department of Commerce.

Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (2) Figures shown include the output of both government and privately-owned plants. (3) Figures for 1941 are estimated. * Includes year-end adjustment of 5,384 tons to cover non-reporting companies.

Synthetic Rubber—By Type

(All Quantities in Long Tons)

New Supply

	GR-S (Buna S)	GR-M (Neoprene)	GR-I (Butyl)	Buna N Types	Total
1944	679,949	56,660	20,252	16,812	773,673
1945	724,859	45,672	52,378	7,871	830,780
1946	613,408	47,766	80,823	5,738	747,735
1947	408,858	31,495	62,824	6,618	509,795
1948	405,492	34,848	56,662	7,012	504,014
1949	310,599	35,215	54,046	11,072	410,932
1950	378,887	50,067	60,915	12,037	501,906
1951	704,525	58,907	76,475	15,333	855,240

Consumption

1944	495,552	46,243	10,763	14,112	566,670
1945	600,145	42,394	43,032	8,029	693,580
1946	632,126	44,357	79,228	5,988	761,699
1947	448,589	37,703	68,838	4,536	559,666
1948	345,313	32,118	58,870	5,771	442,072
1949	299,420	31,753	50,855	8,827	414,381
1950	416,230	43,781	66,348	11,930	538,289
1951	626,444	48,887	70,500	13,066	758,897

Exports

1944	98,380	4,799	530	557	104,266
1945	76,555	5,837	980	406	83,778
1946	68,763	2,642	495	797	72,697
1947	7,951	2,617	62	755	11,385
1948	3,891	2,875	31	585	4,874
1949	1,401	3,330	178	1,574	6,483
1950	900	4,826	31	1,895	7,652
1951	483	6,823	216	1,725	9,249

Stocks at End of Period

1944	116,130	11,739	9,802	5,166	142,927
1945	170,571	9,703	18,378	4,802	203,454
1946	83,483	10,470	19,478	3,755	115,186
1947	40,606	5,737	13,184	3,339	62,366
1948	96,282	5,072	10,995	2,762	115,111
1949	77,731	4,654	12,224	3,433	98,042
1950	36,942	5,733	7,243	2,840	52,758
1951	105,271	8,379	12,481	3,289	129,420

Source: U. S. Department of Commerce.

Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (2) Figures for GR-M and Buna N Types include production of privately-owned plants.

Gasoline Consumption

(In Thousands of Barrels of 42 Gallons)

	1945	1946	1947	1948	1949	1950	1951	1952
Jan.	52,008	51,746	57,057	61,308	63,125	66,981	80,554	86,863
Feb.	48,856	47,668	51,581	56,487	57,980	63,274	72,717	82,043
Mar.	55,364	56,703	59,947	68,171	73,282	78,780	86,486	87,065
Apr.	59,024	62,111	64,149	72,183	75,318	80,350	87,430	98,653
May	60,748	66,800	70,865	77,186	81,665	89,035	100,188	101,137
June	60,580	63,247	71,329	78,044	83,374	90,174	96,095	99,305
July	66,170	69,076	73,441	81,428	82,129	91,677	100,476	.....
Aug.	70,058	66,729	72,089	80,351	84,707	94,507	101,206	.....
Sept.	64,529	62,268	70,159	80,832	86,725	91,803	96,045	.....
Oct.	55,708	66,637	73,277	75,164	79,327	89,067	99,945	.....
Nov.	53,543	61,345	64,158	72,560	76,346	82,688	88,702	.....
Dec.	49,745	61,101	67,506	72,162	75,628	81,032	84,394	.....
Total	696,333	735,417	795,013	871,270	913,713	994,290	1,090,354	.....

Source: U. S. Bureau of Mines.

Reclaimed Rubber

(Including Natural and Synthetic)

(All Quantities in Long Tons)

Year	Production	Consumption Tons	Consumption % to Crude [a]	Exports	Stocks On Hand at End of Period
1936	150,571	141,486	24.6	7,085	19,000
1937	185,033	162,000	29.8	13,233	28,800
1938	122,400	120,800	27.6	7,403	23,000
1939	186,000	170,000	28.7	12,611	25,250
1940	208,971	190,244	29.3	11,347	32,636
1941	274,202	251,231	32.2	13,451	41,750
1942	296,007 [b]	254,820	64.6	30,405	42,532
1943	314,058 [c]	291,082	59.6	15,678	46,201
1944	260,631 [d]	251,083	35.3	11,809	43,832
1945	243,309	241,936	30.2	13,413	28,155
1946	295,612	275,410	26.5	14,461	33,666
1947	291,395	288,395	24.8	14,556	35,943
1948	266,861	261,113	24.4	11,428	32,630
1949	224,029	226,679	22.5	10,637	28,263
1950	314,008	303,733	24.1	11,740	35,708
1951	366,700	346,121	28.5	14,722	45,082
1951:					
Dec.	23,692	22,044	24.8	1,024	45,082
1952:					
Jan.	27,855	26,553	24.9	958	45,067
Feb.	23,953	24,538	24.4	841	43,306
Mar.	22,843	24,797	23.8	1,054	40,579
Apr.	24,004	23,911	23.0	1,070	39,767
May	23,267	22,314	21.7	1,078	40,169
June	21,145	21,791	21.3	1,074	40,083

Source: U. S. Department of Commerce.

Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. [a] Includes natural and synthetic rubber. [b] Includes 893 tons of imports. [c] Includes 67 tons of imports. [d] Includes 21 tons of imports.

Automobile Production in U. S.

(Civilian Production Only)

Year	Passenger Cars	Trucks	Total	Year	Passenger Cars	Trucks	Total
1932	1,135,491	235,187	1,370,678	1942	220,814	133,083	353,897
1933	1,573,512	346,545	1,920,057	1943	0	4,501	4,501
1934	2,177,919	575,192	2,753,111	1944	0	124,819	124,819
1935	3,252,244	694,690	3,946,934	1945	83,792	313,643	397,435
1936	3,669,528	781,862	4,451,390	1946	2,148,699	930,760	3,079,459
1937	3,915,889	892,382	4,808,271	1947	3,558,178	1,220,634	4,778,812
1938	2,000,985	485,852	2,486,837	1948	3,909,270	1,363,856	5,273,126
1939	2,866,796	704,308	3,571,104	1949	5,108,841	1,123,736	6,232,577
1940	3,692,328	721,637	4,413,965	1950	6,665,836	1,332,263	7,998,099
1941	3,744,500	873,381	4,619,681	1951	5,337,729	1,420,432	6,758,161
1951:							
Jan.	478,589	127,583	606,172	July	381,407	110,244	481,651
Feb.	505,865	111,935	617,800	Aug.	426,932	121,993	548,925
Mar.	617,399	136,794	754,193	Sept.	365,906	109,353	475,259
Apr.	503,038	135,415	638,453	Oct.	414,533	110,740	525,273
May	511,938	140,047	651,985	Nov.	356,788	93,179	449,967
June	482,029	134,818	616,847	Dec.	293,305	17,481	310,786
1952:							
Jan.	273,572	101,060	374,632	July	168,327	43,339	211,666
Feb.	333,885	100,706	434,591	Aug.	.....	.....	.....
Mar.	373,231	109,173	482,404	Sept.	.....	.....	.....
Apr.	416,155	112,833	528,988	Oct.	.....	.....	.....
May	397,836	105,658	503,494	Nov.	.....	.....	.....
June	408,250	109,976	518,226	Dec.	.....	.....	.....

Source: Automobile Manufacturers Association.

Note: Figures are based on factory sales. Revisions are made from time to time in these figures and the latest issue should be consulted for accuracy.

Rim Production

	1947	1948	1949	1950	1951
Passenger Car	21,346,004	23,842,796	27,715,344	35,096,404	29,146,048
Truck & Bus	7,737,353	6,920,231	4,238,174	6,625,129	6,877,419
Agricultural	2,633,699	3,140,882	2,695,430	2,853,483	3,019,581
Earth Mover	10,610	13,330	9,895	15,602	28,026
Total	31,727,666	33,917,239	34,658,843	44,590,618	39,071,074

	1952					
	Feb.	Mar.	Apr.	May	June	July
Passenger Car	1,851,197	1,967,057	2,375,344	2,176,901	1,928,280	708,328
Truck & Bus	153,336	573,344	533,865	637,083	386,750	58,955
Agricultural	232,666	224,208	188,335	253,732	165,345	43,821
Earth Mover	4,121	7,468	2,495	456	1,753	494
Total	2,241,320	2,772,077	3,120,039	3,068,172	2,482,127	812,598

Source: The Tire & Rim Association, Inc.

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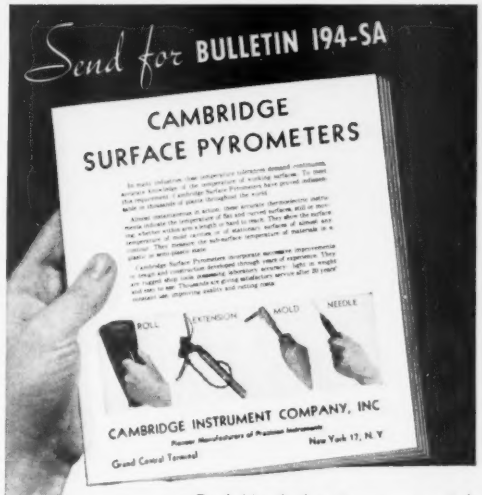

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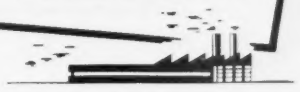

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Automotive Pneumatic Casings

(Thousands of Units)

	Shipments: Original Equipment	Shipments: Replacement	Shipments: Export	Shipments: Total	Production	Inventory End of Period
1939 (total)	18,208	38,022	1,279	57,509	57,613	8,665
Passenger Car.	15,742	33,471	607	49,820	49,933	7,108
Truck and Bus	2,466	4,551	672	7,689	7,680	1,557
1940 (total)	22,252	35,346	1,176	58,774	59,186	9,127
Passenger Car.	19,360	30,903	411	50,874	50,965	7,270
Truck and Bus	2,692	4,443	765	7,900	8,221	1,857
1941 (total)	24,780	39,895	1,489	66,164	61,540	4,436
Passenger Car.	19,855	34,119	586	54,560	50,392	3,165
Truck and Bus	4,925	5,776	903	11,604	11,148	1,271
1942 (total)	6,680	8,872	207	15,759	15,351	6,247
Passenger Car.	910	2,734	38	3,682	2,790	4,432
Truck and Bus	5,770	6,138	169	12,077	12,561	1,815
1943 (total)	6,128	18,547	225	24,900	20,423	1,883
Passenger Car.	82	10,606	71	10,759	7,620	1,132
Truck and Bus	6,046	7,941	154	14,141	12,803	751
1944 (total)	6,654	26,439	263	33,356	33,446	2,013
Passenger Car.	208	18,330	130	18,668	18,819	1,218
Truck and Bus	6,446	8,109	133	14,688	14,627	795
1945 (total)	5,984	36,479	504	42,967	44,524	3,077
Passenger Car.	1,115	25,463	222	26,800	28,200	2,214
Truck and Bus	4,869	11,016	282	16,167	16,324	863
1946 (total)	15,310	65,490	1,512	82,312	82,298	2,448
Passenger Car.	11,086	54,684	653	66,423	66,466	1,763
Truck and Bus	4,224	10,806	859	15,889	15,832	685
1947 (total)	25,056	62,871	3,256	91,183	95,550	6,949
Passenger Car.	19,644	52,857	1,608	74,109	77,795	5,444
Truck and Bus	5,412	10,014	1,648	17,074	17,755	1,505
1948 (total)	26,845	49,148	1,787	77,781	81,314	10,698
Passenger Car.	21,589	41,295	656	63,540	66,738	8,773
Truck and Bus	5,256	7,853	1,132	14,241	14,576	1,925
1949 (total)	31,584	43,466	1,467	76,517	76,369	10,638
Passenger Car.	28,129	36,440	509	65,077	65,140	8,904
Truck and Bus	3,456	7,026	958	11,440	11,228	1,734
1950 (total)	41,349	56,808	1,430	99,587	92,754	3,794
Passenger Car.	36,678	47,103	642	84,423	78,598	3,050
Truck and Bus	4,671	9,705	788	15,164	14,156	743
1951 (total)	32,153	44,612	1,677	78,442	83,405	8,765
Passenger Car.	26,729	34,226	723	61,678	66,546	6,973
Truck and Bus	5,424	10,386	954	16,764	17,859	1,791
1952:						
Apr. (total)	2,814	4,038	115	6,967	7,189	13,295
Passenger Car.	2,314	3,466	46	5,826	5,827	10,585
Truck and Bus	499	572	69	1,140	1,363	2,711
May (total)	2,719	4,624	101	7,443	7,433	13,263
Passenger Car.	2,224	3,996	32	6,252	6,069	10,589
Truck and Bus	495	628	68	1,191	1,364	2,975
June (total)	2,617	6,356	130	9,003	7,367	11,668
Passenger Car.	2,191	5,569	75	7,834	6,067	8,650
Truck and Bus	426	687	55	1,169	1,300	3,018

Source: The Rubber Manufacturers Association, Inc.

Cotton, Rayon and Nylon Tire Fabrics

(Production in Thousands of Pounds)

	Cotton: Tire Cord Not Woven	Cotton: Cord Fabric Woven	Cotton: Chafer and All Other Tire Fabrics	Cotton: Total	Rayon and Nylon[b]: Tire Cord Not Woven	Rayon and Nylon[b]: Tire Cord And Other Tire Fabrics	Rayon and Nylon[b]: Total
1948:							
Jan.-Mar.	18,546	50,251	19,391	88,188	*a*	60,569	60,569
Apr.-June	15,585	45,385	18,213	79,183	*a*	59,759	59,759
July-Sept.	29,743	45,927	*c*	75,670	*a*	63,642	63,642
Oct.-Dec.	13,321	34,424	15,879	63,624	*a*	65,258	65,258
Total	77,195	175,987	53,483	306,665	.....	249,228	249,228
1949:							
Jan.-Mar.	*d*	33,213	25,395	56,608	*a*	68,296	68,926
Apr.-June	5,309	29,114	13,617	48,040	*a*	68,269	68,269
July-Sept.	1,343	16,620	11,141	29,104	15,640	55,969	71,609
Oct.-Dec.	180	17,650	11,886	29,716	12,967	58,890	72,857
Total	6,832	96,597	62,039	163,468	28,607	251,424	281,661
1950:							
Jan.-Mar.	3,939	19,210	12,948	36,097	12,469	60,981	73,450
Apr.-June	11,077	29,498	14,071	54,646	11,510	59,966	71,476
July-Sept.	10,529	39,792	15,101	65,152	13,161	61,614	74,775
Oct.-Dec.	13,314	37,759	14,405	65,578	12,942	63,399	76,341
Total	38,859	126,259	56,525	221,473	50,082	245,960	296,476
1951:							
Jan.-Mar.	11,497	38,209	16,737	66,503	11,878	65,512	77,390
Apr.-June	12,608	42,491	17,055	72,154	11,979	61,957	73,936
July-Sept.	16,744	44,340	17,433	78,517	12,091	67,982	80,073
Oct.-Dec.	14,237	43,820	13,899	71,956	*a*	83,354	83,354
Total	55,116	168,920	65,124	289,160	35,948	278,805	314,753

Source: U. S. Bureau of the Census.

Notes: (a) Included with tire cord and fabrics to avoid disclosures of operations of individual mills. (b) Fuel cell fabrics are not included with rayon and nylon tire cord and fabrics. (c) Included with tire cord not woven. (d) Included with chafer and all other tire fabrics.

Automotive Inner Tubes

(Thousands of Units)

	Shipments: Original Equipment	Shipments: Replacement	Shipments: Export	Shipments: Total	Production	Inventory End of Period
1940	22,172	29,070	972	52,214	52,237	7,017
1941	24,722	33,749	1,232	59,703	57,433	4,686
1942	6,895	7,213	159	14,267	12,685	6,206
1943	6,350	12,474	189	19,014	15,014	2,626
1944	6,460	20,569	196	27,224	27,488	2,813
1945	5,988	33,906	411	40,304	41,742	3,627
1946	15,327	59,357	1,424	76,108	77,251	3,820
1947	25,046	46,560	2,483	74,088	79,181	8,059
1948	26,833	40,548	1,119	68,499	70,033	9,641
1949	31,521	31,450	887	63,858	65,114	10,657
1950	41,240	42,671	811	84,723	80,179	.....
1951	32,151	32,284	1,071	65,507	67,249	10,094
1952:						
Mar.	2,484	2,458	92	5,034	5,497	10,900
Apr.	2,813	2,410	83	5,305	5,481	11,013
May	2,718	2,848	64	5,330	5,771	11,493
June	2,610	3,323	107	6,040	5,536	10,974

Source: The Rubber Manufacturers Association, Inc.

Smoked Sheets—Spot Closing Prices

(New York Market—Cents per Pound)

Year	High	Low	Avg.	Year	High	Low	Avg.
1910	288	141	206.60	1931	8⅜	4⅛	6.17
1911	184	114	141.30	1932	4¾	2½	3.49
1912	140	108	121.60	1933	9⅞	2⅞	5.96
1913	113	59	82.04	1934	15⅞	8¾	12.92
1914	93	56	65.33	1935	13¾	10⅝	12.37
1915	79	58½	65.85	1936	23	13½	16.41
1916	102	55	72.50	1937	26⅞	14	19.39
1917	90	52	72.23	1938	17⅛	10¼	14.64
1918	70	40	60.15	1939	24	14⅛	17.57
1919	57	38¼	48.70	1940	24	18¼	20.10
1920	56½	16	36.30	1941	24⅞	19⅛	22.40
1921	21¼	11½	16.36	1942	22½	22½	22.50
1922	28⅝	13⅝	17.50	1943	22½	22½	22.50
1923	37½	24¾	29.45	1944	22½	22½	22.50
1924	40⅛	17⅝	26.20	1945	22½	22½	22.50
1925	121	34⅜	72.46	1946	22½	22½	22.50
1926	88½	36¾	48.50	1947	25	14	20.00
1927	41⅜	33	37.72	1948	25	18	21.99
1928	41¼	17	22.48	1949	19¾	15⅞	17.57
1929	26⅞	15½	20.55	1950	86	18	41.10
1930	16½	7½	11.98	1951	76	52	(a)

Note: Price was fixed by Government on August 6, 1941, at 22½c a pound for non-war uses. Free trading was resumed May 1, 1947. (a) Free trading suspended March 31, 1951. GSA selling price ranged between 52 and 66c during balance of year.

Spot Closing Cotton Prices

(Middling Upland Grade—New York Market—in Cents)

Average Monthly Price Per Pound

	1945	1946	1947	1948	1949	1950	1951	1952
Jan.	22.36	25.49	32.58	36.09	33.37	31.89	45.04	42.96
Feb.	22.29	26.57	33.91	33.63	33.41	32.79	(a)	41.64
Mar.	22.43	27.52	35.89	35.04	33.44	32.65	46.06	41.70
Apr.	21.88	28.40	35.89	35.10	33.84	33.23	46.06	41.29
May	22.30	28.17	36.51	38.57	33.73	33.64	46.06	39.68
June	23.42	29.89	37.83	38.12	33.56	33.61	46.06	41.31
July	23.27	34.11	38.03	34.89	32.99	38.11	41.21	40.37
Aug.	23.10	36.31	34.83	32.23	32.06	38.93	35.93	40.42
Sept.	23.25	37.59	32.21	31.92	30.94	41.62	36.20	.....
Oct.	23.85	36.79	33.39	32.01	30.32	40.66	38.13	.....
Nov.	24.71	31.50	34.50	32.15	30.52	43.11	42.70	.....
Dec.	25.21	33.03	36.74	32.90	31.08	43.37	43.32	.....
Average for Year	23.25	31.28	35.11	34.64	32.44	37.05	42.43	.....

Note: The Government established a ceiling price of 45.76c for spot cotton on March 3, 1951. (a) Trading suspended during February.

Consumption of Vinyl Resins

(In Thousands of Pounds)

	Sheeting and Film[a]	Textile and Paper Coating Resins	Molding and Extrusion Materials	All Other
1948	98,021	31,085	73,598	21,147
1949	157,544	29,470	81,842	19,792
1950	227,149	46,044	113,889	21,868
1951	161,547	43,688	134,890	23,934
1952:				
Jan.	13,125	3,031	11,772	2,276
Feb.	12,734	3,327	11,190	1,772
Mar.	14,016	3,368	12,770	2,390
Apr.	12,484	3,490	11,993	1,963

Source: U. S. Tariff Commission.

Note: (a) Includes weight of fillers, plasticizers, extenders and safety glass sheeting. Beginning January, 1951, statistics are listed on a resin content basis.

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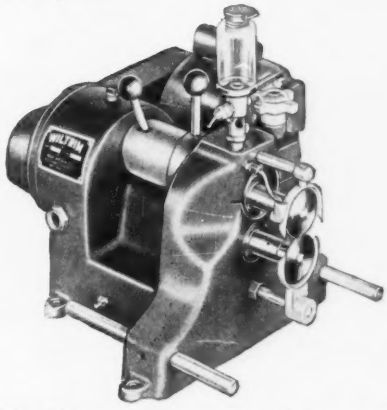

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Rubber Industry Employment, Wages and Hours

All Rubber Products

	1951				1952			
Mo.	Production Workers (thousands)	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings	Production Workers (thousands)	Average Weekly Earnings	Average Weekly Hours	Average Hourly Earnings
Jan.	222	$66.78	40.4	$1.653	218	$74.19	40.9	$1.814
Feb.	222	63.37	38.9	1.629	215	73.31	40.5	1.810
Mar.	220	65.88	40.0	1.647	215	72.58	40.3	1.801
Apr.	219	65.96	40.0	1.649	213	70.94	39.5	1.796
May	220	68.56	41.3	1.660	213	72.24	40.0	1.806
June	220	71.27	41.9	1.701	214	....	....	....
July	217	70.81	41.0	1.727	....	....	....	....
Aug.	218	69.52	40.7	1.708	....	....	....	....
Sept.	218	70.18	40.9	1.716	....	....	....	....
Oct.	215	68.67	40.3	1.704	....	....	....	....
Nov.	219	69.46	40.5	1.715	....	....	....	....
Dec.	219	73.91	41.2	1.794	....	....	....	....

Tires and Tubes

Jan.	91.3	73.69	38.4	1.919	94.4	86.99	40.9	2.127
Feb.	90.6	66.95	35.5	1.886	94.2	85.75	40.6	2.112
Mar.	88.3	71.40	37.6	1.899	93.9	83.46	39.8	2.097
Apr.	87.4	70.35	37.0	1.896	94.2	81.02	39.1	2.072
May	88.1	73.92	39.4	1.927	94.4	82.18	39.3	2.091
June	89.9	82.44	41.7	1.977	....	....	....	....
July	90.0	83.67	41.4	2.021	....	....	....	....
Aug.	91.5	82.07	41.2	1.992	....	....	....	....
Sept.	92.4	81.64	40.9	1.996	....	....	....	....
Oct.	89.8	78.26	39.9	1.974	....	....	....	....
Nov.	94.8	80.27	40.5	1.982	....	....	....	....
Dec.	95.4	86.26	41.0	2.104	....	....	....	....

Rubber Footwear

Jan.	24.9	57.53	41.6	1.383	25.4	60.27	40.1	1.503
Feb.	25.3	55.87	40.6	1.376	24.7	60.46	39.8	1.519
Mar.	25.0	58.17	41.4	1.405	24.2	61.51	40.2	1.530
Apr.	24.8	59.82	42.1	1.421	22.0	59.42	39.3	1.512
May	25.4	61.48	42.9	1.433	23.6	60.76	40.0	1.519
June	25.7	59.98	42.3	1.418	....	....	....	....
July	24.8	54.68	39.0	1.402	....	....	....	....
Aug.	25.2	57.04	40.8	1.398	....	....	....	....
Sept.	25.3	55.94	40.1	1.395	....	....	....	....
Oct.	25.5	56.76	40.0	1.404	....	....	....	....
Nov.	25.6	56.64	40.2	1.409	....	....	....	....
Dec.	28.5	59.95	40.7	1.473	....	....	....	....

All Other Rubber Products

Jan.	105.8	63.06	41.9	1.505	97.9	65.63	41.2	1.593
Feb.	106.3	61.95	41.3	1.500	96.3	64.43	40.6	1.587
Mar.	106.3	63.13	41.7	1.514	97.2	64.83	40.8	1.589
Apr.	106.3	63.81	41.9	1.523	96.8	63.64	39.9	1.595
May	106.0	64.09	42.5	1.508	94.0	65.24	40.7	1.603
June	104.7	64.47	42.0	1.535	....	....	....	....
July	103.2	63.29	41.1	1.540	....	....	....	....
Aug.	101.2	61.42	40.3	1.524	....	....	....	....
Sept.	100.2	63.06	41.0	1.538	....	....	....	....
Oct.	99.4	62.68	40.7	1.540	....	....	....	....
Nov.	98.2	62.36	40.6	1.536	....	....	....	....
Dec.	97.9	63.45	41.3	1.537	....	....	....	....

Source: U. S. Department of Commerce and Labor.

Note: Data are based upon reports from cooperating establishments covering both full and part-time employees who worked during or received pay for the pay period ending nearest the 15th of the month. The employment series have been adjusted to levels indicated by Federal Security Agency data for 1947, and have been carried forward from 1947 bench-mark levels, thereby providing consistent series. Hours and earning data pertain only to production and related workers.

Production Index for the Rubber Industry

Production 1935-1939 = 100

(Based on man-hours)

	1950	1951	1952		1950	1951	1952
Jan.	194	244	248	July	232	243	....
Feb.	195	235	243	Aug.	236	243	....
Mar.	197	239	242	Sept.	244	245	....
Apr.	203	238	234	Oct.	250	239	....
May	213	247	238	Nov.	250	245	....
June	221	251	241	Dec.	251	250	....

Source: U. S. Department of Commerce.

Sales by the Rubber Industry

(In Millions of Dollars)

	1950	1951	1952		1950	1951	1952
Jan.	265	454	468	July	454	438	....
Feb.	273	434	442	Aug.	457	467	....
Mar.	293	459	407	Sept.	404	435	....
Apr.	288	439	438	Oct.	405	445	....
May	331	432	425	Nov.	397	438	....
June	350	433	....	Dec.	424	363	....

Source: U. S. Department of Commerce.

Rubber Manufacturers' Inventories

(Based upon Book-Value)

(In Millions of Dollars)

	1950	1951	1952		1950	1951	1952
Jan.	524	562	797	July	503	616	....
Feb.	526	555	804	Aug.	483	640	....
Mar.	532	554	820	Sept.	502	659	....
Apr.	536	565	832	Oct.	524	705	....
May	540	583	853	Nov.	564	739	....
June	544	610	....	Dec.	542	799	....

Source: U. S. Department of Commerce.

Various Compounding Materials Consumed by the Rubber Industry

Material	1945	1946	1947	1948	1949	1950	1951
Antimony, Primary:							
Short tons	.....	.....	39	41	55	.....	.....
% of total	.....	.....	.002	.003	.005	.....	.....
Asphalt: [a]							
Short tons	19,483	28,715	32,113	19,967	18,050	26,819	21,414
% of total	.005	.007	.007	.004	.003	.003	.003
Barite (Barytes):							
Short tons	10,000	20,000	17,000	10,000	14,000	.....	.....
% of total	2.1	4.4	2.1	2.85	2.53	.....	.....
Carbon Black:							
Short tons	402,193	470,732	471,790	435,282	383,565	515,184	530,614
% of total	95.5	95.3	94.3	95.5	93.3	92.9	92.9
Clay, Kaolin:							
Short tons	109,936	162,393	166,201	176,965	197,341	263,306	.....
% of total	11.7	12.3	11.5	11.3	13.1	15.0	.....
Clay, Fire & Stoneware:							
Short tons	7,800	12,951	17,970	15,480	.....	.....	.....
% of total	0.1	0.2	0.2	0.2	.....	.....	.....
Lime:							
Short tons	7,170	3,193	580	1,154	715	908	.....
% of total	0.12	0.05	0.01	0.02	.0002	.0002	.....
Litharge:							
Short tons	1,864	2,131	2,205	2,835	.....	.....	.....
% of total	1.3	1.6	1.3	1.8	.....	.....	.....
Lithopone:							
Short tons	977	1,607	3,085	4,192	3,245	.....	.....
% of total	0.7	1.1	1.9	3.0	4.1	.....	.....
Mica, Ground:							
Short tons	3,715	4,951	3,900	4,372	3,856	.....	.....
% of total	7.1	8.0	6.0	7.0	7.0	.....	.....
Sulfur:							
Short tons	64,960	72,800	72,800	70,560	59,360	.....	.....
% of total	2.0	2.2	1.8	1.7	1.5	.....	.....
Talc: [b]							
Short tons	63,758*	65,980	71,840	66,226	53,414	.....	.....
% of total	16.0	14.4	13.9	13.0	12	.....	.....
Zinc Oxide:							
Short tons	63,447	83,776	82,248	82,895	58,496	82,944	71,507
% of total	49.6	53.1	51.2	54.9	52.5	51.6	48.5

Source: U. S. Bureau of Mines.

Notes: [a] Solid and semi-solid products of less than 200 penetration. [b] Includes prophyllite and ground soapstone. * Revised.

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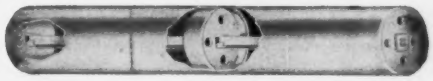

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INDEX TO ADVERTISERS

A

Adamson United Co. —
Adhesive Products Corp. 829
Aetna-Standard Engineering Co. —
Akron Equipment Co. —
Akron Preform Mold Co. 809
Akron Rubber Machinery Co. 837
Albert, L. & Son 838
Alco Oil & Chemical Corp. 815
Allen Extrusion Machine Div.
Industrial Ovens, Inc. —
Aluminum Flake Co. 838
American Cyanamid Co.
Calco Chemical Div. 717
American Machine & Foundry Co. 710
American Polymer Corp. 823
American Zinc Sales Co. 737
Ames, B. C. Company 827
Armstrong Machine Works —
Atlas Electric Devices Co. 819
Atlas Valve Co. 831

B

Bagley & Sewall Co. —
Baird Rubber and Trading Co. —
Baker & Adamson Products, General Chemicals
Div., Allied Chemical & Dye Corp. 729
Baker Castor Oil Co. 743
Barrett Div., Allied Chemical & Dye Corp. 716
Beacon Chemical Industries, Inc. —
Bestread Products Co. 836
Binney & Smith Co. Insert Following 798
Black Rock Mfg. Co. —
Bolling, Stewart & Company, Inc. —
Bridgwater Machine Co., Athens Machine Div. —
Brockton Cutting Die & Machine Co. —
Brooklyn Color Works, Inc. 837
Brown Company —

C

Cabot, Godfrey L., Inc. 755
Cambridge Instrument Co. 831
Carey, Philip, Mfg. Co. —
Carter Bell Mfg. Co. 820
Chemical & Pigment Co., Div. Glidden Co. 751
Chemical Publishing Co. —
CLASSIFIED ADVERTISING 835, 836, 837, 838
Cleveland Liner & Mfg. Co. 718
Colledge, E. W., General Sales Agent, Inc. 824
Columbia-Southern Chemical Corp. 741
Columbian Carbon Co. Insert Following 798
Concord Mica Corp. —
CONSULTANTS SECTION 838
Continental Carbon Co. 714, 715
Coulter, James, Machinery Co. 819

D

Diamond Alkali Company
Pure Calcium Prod. Div. 726
Dow Corning Corp. 728
du Pont de Nemours, E. I., & Co., Inc.
Rubber Chemicals Div. Second Cover

E

Elm City Rubber Co. 836
Emerson Apparatus Co. 811
Emery Industries, Inc. —
Erie Engine & Mfg. Co. 727
Erie Foundry Company —

F

Farrel-Birmingham Co., Inc. 732, 733
Ferry Machine Co. —
Fidelity Machine Co. 821
Firestone Tire & Rubber Co. —
Flexo Supply Co. 833

G

Gammeter, W. F., Co. 837
Gelb, R., & Sons, Inc. —
General Atlas Carbon Co. 745
General Chemical Division, Allied
Chemical & Dye Corp. 729
General Latex & Chemical Corp. 813
General Magnesite & Magnesia Co. —
Genseke Brothers 747
Gidley Research Institute 813
Giffels & Vallet, Inc. 742
Glidden Co., Chemical & Pigment Co. Div. 751
Goodrich, B. F., Chemical Co. (Chemical) —
Goodrich, B. F., Chemical Co. (Hycar) 707
Goodyear Tire & Rubber Co.
(Chemical Div.) 709, 711, 713
Gummi und Asbest —
Gussett Boiler and Welding Co. 760

H

Hale & Kullgren, Inc. —
Hall, C. P., Co. 734
Hardesty Chemical Co., Inc. 833
Hardman, H. V., Co., Inc. 833
Harwick Standard Chemical Co. 721
Hercules Powder Company, Inc. —
Heveatex Corporation 762
Hoggson & Pettis Mfg. Co. —
Holliston Mills, Inc. 815
Holmes, Stanley H., Co. 817
Howe Machinery Co., Inc. 838
Huber, J. M., Corp. 764

I

Indoil Chemical Co. 719
Industrial Ovens, Inc. 836
Institution of the Rubber Industry —
Interstate Welding Service —

J

Jenkins, J. W., Co., Inc. 833
Johnson Steel & Wire Co., Inc. —

K

K.B.C. Industries, Inc. 836
Kautschuk und Gummi —

L

Lambert, E. P., Co. 758

M

Mapico Color Div., Columbian Carbon Co. 816
Marbon Corp. 756
Marine Magnesium Products, Division of
Merck & Co., Inc. —
Maryland Cork Co. 833
Monsanto Chemical Co.
Organic Division 759
Mt. Vernon-Woodberry Mills, Inc. 750
Muehlstein, H., & Co., Inc. 807
Mumper, James F., Co. 838

N

National Chemical & Plastics Co. 833
National Lead Co. 738
National Rosin Oil Products, Inc. 837
National Rubber Machinery Co. —
National Sherardizing & Machine Co. 838
National-Standard Co. 736
Natural Rubber Bureau —
Naugatuck Chemical,
U. S. Rubber Co. 735, 749, 766
Neville Co. 761
New England Engineering —
New Jersey Zinc Co. 746

O

Olin, R. R., Laboratories 838
Osborn Mfg. Co. —

P

Pan American Chemicals 811
Pennsylvania Industrial Chemical Corp. —
Pequanoc Rubber Co. —
Phillips Chemical Co. 708
Pike, S. J., & Co., Inc. 827
Pittsburgh Coke & Chemical Co. 725
Polymer Corp. 740
Preventative Maintenance Co. 831
Progressive Service Co. 822

R

Rand Rubber Co., Inc. 836
Randall, Frank E., Co. 825
Rare Metal Products Co. 837
Revue Generale du Caoutchouc —
Richardson, Sid Carbon Co. 840
Reflex Rubber Company Inc. 835
Royle, John, & Sons 818
Rubber Corp. of America, Latex Div. 829
Rubber Raw Material —

S

St. Joseph Lead Co. 730
Schrader's, A., Son 731
Schulman, A., Inc. Inside Back Cover
Scott Testers, Inc. Back Cover
Sharples Chemicals Inc. —
Shaw, Francis, & Co., Ltd. —
Shell Chemical Corp. 753
Shell Oil Company, Inc. 757
Simplex Cloth Cutting Machine Co., Inc. —
Sivon Machine Co. 825
Skelly Oil Co., Solvents Div. —
Snell, Foster D., Inc. 829
Sorvall, Ivan —
South Florida Test Service 838
Southeastern Clay Co. —
Southern Clays, Inc. 754
Spadone Machine Co. —
Spencer Products Co. 839
Stamford Rubber Supply Co. 762
Standard Machinery Co. 722
Stanley Chemical Co. —
Stanley Electric Tool Div. —
Stauffer Chemical Co. —
Stein, Hall Co., Inc. —
Stoner's Ink Co. 839
Sun Oil Co. 805

T

Tanney-Costello Inc. —
Taylor Instrument Companies —
Testworth Laboratories, Inc. —
Thiokol Corporation 752
Thomaston Mills 827
Titanium Pigment Corp. 720
Tracerlab, Inc. 758
Trade News Service —
Tumpeer Chemical Co. 829
Turner Halsey Co. 750

U

United Carbon Co. Insert Following 722
United Engineering & Foundry Co. 763
United Rubber Machinery Exchange 837
U. S. Rubber Reclaiming Co. 744
U. S. Stoneware Co. —
Utility Mfg. Co. 822

V

Vanderbilt, R. T., Co. Front Cover
Velsicol Corp. —

W

Wellington Sears Co. 712
Western Supplies Co. 817
White, J. J., Products Co., Inc. 760
Whittaker, Clark & Daniels, Inc. —
Williams, C. K., & Co. —
Wills Rubber Trimming Machine Co. 833
Wilson, Charles T., Co., Inc. 824
Witco Chemical Co. 714, 715, 740
Woloch, George Co. —
Wood, R. D., Co. 739
Wyandotte Chemicals Corp. 836

X

Xylos Rubber Co. —

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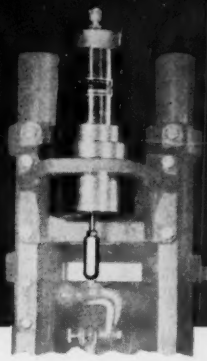

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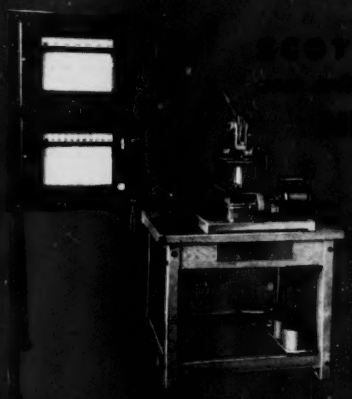

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INDEX

Volume 72—October, 1952-March, 1953

A

Acrylic Ester-Acrylonitrile Copolymers, Vulcanizable, Preparation and Properties of 631
ACRYLIC RUBBERS
Pilot Plant Production of Lactoprene EV.. 353
Preparation and Properties of Vulcanizable Acrylic Ester-Acrylonitrile Copolymers
E. M. Filachione, T. J. Fitzpatrick, C. E. Rehberg, C. F. Woodward, W. E. Palm and J. E. Hansen 631
Acrylonitrile, Monsanto Opens New Unit on 653
Adequate Fire Protection System Important Adjunct to Spalding Expansion Program.. 223
Air Force (Global), Present and Future Requirements of Rubberlike Materials for a 64
AISENBERG, I., NIELSON, C., and LEONARD, F. Determination of Volume Shrinkage of Latex Cast Elastomeric Films 759
Akron University Fellowships Presented by Goodyear and Firestone 662
ALDEN, G. E., HOWERTON, W. W., DIETZ, T. J., and SNYDER, A. D.
Pilot Plant Production of Lactoprene EV.. 353
Alfin Rubbers—A New Type of Polymer
Avery A. Morton 473
AMERICAN CHEMICAL SOCIETY
Fisher Named President-Elect. 373
AMERICAN INSTITUTE OF CHEMICAL ENGINEERS
Akron Section Elects Officers 788
AMERICAN PHYSICAL SOCIETY
Division of High Polymer Physics to Hold Meeting (Mar. 26-28) (Abstracts of Papers) 762
AMERICAN SOCIETY OF MECHANICAL ENGINEERS
Rubber and Plastics Division Meets in Chicago (Sept. 8) 82
Rubber and Plastics Division Meets in New York (Dec. 4-5) 502
AMERICAN SOCIETY FOR TESTING MATERIALS
New York District Holds Technical Session on Rubber (Dec. 8) 500
Painter Named Executive Secretary 97
SAE-ASTM Joint Committee on Automotive Rubber Reports Considerable Progress 368
AMERICAN STANDARDS ASSOCIATION
Issues Specifications for Rubber Insulating Gloves 506
Anolith Color Process (American Anode)... 104
AUTHORS
Aisenberg, I. 759
Alden, G. E. 353
Bartholomew, E. R. 64
Bernstein, S. 350
Bowell, S. T. 215
Braden, James B. 775
Braendle, H. A. 205
Brown, C. F. 211
Clark, C. A. 343
Clinebell, Betty Jo 485
Coe, B. 220
Connors, H. E. 343
Dietz, T. J. 353
Filachione, E. M. 631
Fitzpatrick, T. J. 631
Gage, F. W. 765
Hansen, J. E. 631
Hendriksen, R. N. 773
Howerton, W. W. 353
Kirshenbaum, A. D. 625
Kramer, John S. 774
Leonard, F. 759
Morton, Avery A. 473
Neilson, C. 759
Nellen, A. H. 625
Palm, W. E. 631
Rand, W. M., Jr. 477
Rehberg, C. E. 631
Reich, M. H. 619
Reznicek, A. F. 775
Rush, I. C. 215
Snyder, A. D. 353
Stacy, R. T. 350
Straka, Leora E. 485
Streng, A. G. 625
Stueber, C. C. 765
Svendsen, E. C. 774
Sweitzer, C. W. 55
Taft, W. K. 619
Thompson, D. C. 638
Winkelmann, H. A. 773

Page Arrangements for Volume 72

No.	Date	From Page	To Page
1	October, 1952	1	146
2	November, 1952	147	288
3	December, 1952	289	422
4	January, 1953	423	558
5	February, 1953	559	706
6	March, 1953	707	842

AUTHORS (Cont'd)
Wolf, Ralph F. 765
Woodward, C. F. 631
Yoran, Calvin S. 772

B

Bacon Industries, Inc., Formed 506
Balloons in Cancer Research 227
Banbury, Use of, to Modify Properties of Synthetic Elastomers 619
BARTHOLOMEW, E. R.
Present and Future Requirements of Rubberlike Materials for a Global Air Force 64
BERNSTEIN, S., and STACY, R. T.
Beta-Ray Gaging in the Rubber Industry.. 350
Beta-Ray Gaging in the Rubber Industry
R. T. Stacy and S. Bernstein 350
BOOK REVIEWS
Adhesion and Adhesives (Elsevier) 680
Adjustable Voltage DC Drives for Rubber and Plastics Manufacturing Plants (G-E) 400
Aliphatic Nitrogen Compounds (Carbide & Carbon) 820
Aniline Black (American Cyanamid) 266
Aniline Story (Allied Chemical) 684
Annual Report on the Progress of Rubber Technology: 1951 (I. R. I.) 538
Barrett Elevators and Cranes (Barrett-Cravens) 822
Barrett Standard Industrial Chemicals (Barrett) 822
Blaw-Knox Process Equipment (Blaw-Knox) 270
B-L-E Antioxidant (Naugatuck Chem.)... 118
Carbon Black Pigments (Cabot) 268
Caustic Soda (Wyandotte Chemicals).... 540
Central Hydraulic Systems for the Rubber and Plastics Industries (Greer Hydraulics) 540
Chemical Engineering Operations (Chemical Pub.) 116
Chemicals of Commerce: 2nd Edition (Van Nostrand) 682
Classified Directory of Wisconsin Manufacturers: 1952-53 (Wisconsin Manufacturers Association) 536
Cleveland Tramrail Engineering and Application Data (Cleveland Crane & Eng.)... 824
Colloid Science. Vol. I—Irreversible Systems (Elsevier) 396
Commercial Neoprene Weatherproof Wire (DuPont) 822
Comparative Evaluation of Hycar American Rubbers (Goodrich Chem.) 402
Compressed Air Power in Industrial Production (Compressed Air & Gas Inst.)... 824
Condensed Reference File of Bakelite and Vinylite Plastics and Resins (Bakelite).. 266
Corn in Industry (Corn Industries Research Foundation) 122
Cutters for the Rubber Industry (Taylor-Stiles) 118
Development of Executive Talent (A.M.A.) 536
Di-Acro Precision Machines for Die-Less Duplicating (O'Neil-Irwin) 270
Directory of the International Rubber Industry (Verlag fur Wirschaftsliteratur).. 534
DuPont—The Autobiography of An American Enterprise (Scribner's) 264
Economics of American Manufacturing (Holt) 116
BOOK REVIEWS (Cont'd)
Electronik Recorders-Indicators (Minneapolis-Honeywell) 400
Encyclopedia of Surface-Active Agents (Chemical Pub.) 398
Fatty Acids (Association of American Soap and Glycerine Producers) 769
Fluid Rubber Compositions: Their Preparation and Applications (Rubber Technical Developments) 268
Fundamental Principles of Polymerization: Rubbers, Plastics and Fibers (Wiley).... 396
Goodrich Industrial Tire Guidebook (Goodrich) 120
Goodrich Reclaimed Rubber (Goodrich).. 822
Goodyear Story (Goodyear) 534
Guide to Improved Packaging with Bakelite and Vinylite Plastics and Resins: 1953 (Bakelite) 400
Gwilliam Ball and Roller Bearings (Gwilliam) 270
Handbook of Chemistry: 8th Edition (Handbook Publishers) 818
Handbook of Engineering Fundamentals (Wiley) 682
Harshaw Vinyl Stabilizers (Harshaw Chem.) 824
Heligen Colors (General Dyestuff) 540
Honeywell pH and Conductivity Recorders and Controllers (Minneapolis-Honeywell). 684
Hycar Softener Study (Goodrich Chem.).. 820
Instrumentation, Tools and Accessories for Olsen Universal Testing Machines (Tinius Olsen) 402
Instruments Accelerate Research (Brown Instruments) 769
Kalabond Rubber-to-Metal Adhesive (General Tire) 266
Ko-Blend I. S. (General Tire) 122
Le-Hi Hose Clamps (Hose Accessories)... 122
Liquid Agitators and Processing Vessels (Struthers-Wells) 120
Lustrex Latices: Polymerized Styrene Resin Dispersions (Monsanto) 540
Machinery for Processing Rubber and Plastics (Stewart Bolling) 118
Maleic Anhydride Derivatives (Wiley).. 680
Molded Products and Coatings (Franklin Institute) 684
Money in Exports—Vol. 2 (Walter Buchler) 538
Natural Rubber Latex and Its Applications: I—An Introduction to Its Origin, Properties and Manufacture (BRBD) 398
Neoprene Latex Foam (DuPont) 684
New Ideas in Cleaning for the Rubber Industry (Oakite Products) 118
New Ideas for Efficient Passenger Transportation (Goodyear) 122
New Simplified "50" Series Measuray (Sheffield) 402
Patterson-Kelley Equipment (Patterson-Kelley) 820
Pepton 22 Plasticizer in Oil-Extended GR-S (American Cyanamid) 268
Philblack E in Natural and Synthetic Rubbers (Phillips Chemical) 686
Physical Properties of Synthetic Organic Chemicals (Carbide & Carbon) 400
Pittsburgh Chemicals (Pittsburgh Coke & Chemical) 684
Plasticizer DP-250 (Drew) 540
Plastics Molding (Wiley) 682
Pliolite S 6-B in Soles and Heels (Goodyear) 686
Products and Services for Industry and Agriculture (American Cyanamid) 266
RC Latex and Chemicals (Rubber Corp. of America) 118
Rubber Trade Directory of Great Britain: 1952-53 (I.R.J.) 818
Safe Working on Horizontal Two-Roll Mills (National Joint Industrial Council for the Rubber Manufacturing Industry) 116
Sheet and Plate Fabrication (Kirk & Blum Manufacturing) 822
Staycin I (Baker Castor Oil) 120
Standards on Rubber Products (A.S.T.M.) 818
Standards on Textile Materials (A.S.T.M.) 536
Story of Safety (DuPont) 268
Styrene: Its Polymers, Copolymers and Derivatives (Reinhold) 264